Task Order No. 12
Contract No. PCE-I-00-96-00002-00

ECONOMIC OPPORTUNITIES IN WILDLIFE MANAGEMENT AREAS

Report Prepared

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June 23, 2000

For

The Wildlife Division of the Ministry
Of Natural Resources and Tourism

and

USAID/Tanzania

Environmental Policy and Institutional Strengthening Indefinite Quantity Contract (EPIQ)
Partners: International Resources Group, Winrock International,
and Harvard Institute for International Development

Subcontractors: PADCO; Management Systems International; and Development Alternatives, Inc.

Collaborating Institutions: Center for Naval Analysis Corporation; Conservation International; KNB Engineering and Applied Sciences, Inc..; Keller-Bliesner Engineering; Resource Management International, Inc.;
Tellus Institute; Urban Institute; and World Resources Institute

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ACRONYMS

AA	Authorized Association
B/C	Benefit / cost analysis
CBC	Community-Based Conservation
CBNRM	Community-based natural resource management
DC	District Council
DoE	Division of the Environment
EIA	Environmental Impact Assessment
EPIQ	Environmental Policy and Institutional Strengthening Indefinite Quantity Contract
GCA	Game Controlled Area
GMP	General Management Plan
GOT	Government of Tanzania
IRR	Internal rate of return
LGA	Local Government Authority
LUP	Land Use Plan
NCAA	Ngorongoro Conservation Area Authority
NGO	Non-governmental organization
NRM	Natural resource management
NP	National Park
NPV	Net present value
PA	Protected area
SO	Strategic Objective
TANAPA	Tanzania National Park Association
TAWICO	Tanzania Wildlife Corporation
TOR	Terms-of-Reference
USAID	United States Agency for International Development
VC	Village Council
WCA	Wildlife Conservation Act
WD	Wildlife Division
VGS	Village Game Scouts
VLA	Village Land Act
VNRC	Village Natural Resources Committee
VPO	Vice President's Office
WMA	Wildlife Management Area
WPT	Wildlife Policy of Tanzania

ACKNOWLEDGMENTS

The successful completion of this study is largely due to the support received from the Wildlife Division, the EPIQ staff, and USAID/Tanzania. We very much appreciate the enthusiastic cooperation of the WD leadership and are particularly grateful for the participation of Miriam Zachariah and Matthew Maige from the WD who traveled with the team and actively participated in the meetings throughout the study period. Their insights and intimate knowledge of the biological, political, and financial realities of the wildlife sector in Tanzania were invaluable. We are also grateful for the support received from the African Wildlife Foundation in Arusha who provided the team with key information on the geographical dispersion of potential WMAs, problems and pitfalls, and logistics in setting up meetings. When visiting the MBOMIPA project in Iringa, the team spent a delightful and rich-in-learning day in the project area with the Community Development Officer—Ms. Dorothy Bikurakule—to whom we owe thanks. We also appreciate the cooperation of the MBOMIPA staff despite the short notice of our arrival. Finally, we wish to express our appreciation to the many individuals and institutions interviewed throughout this entire process for their generous contribution of their time and insights. In addition, and most importantly, we wish to express our appreciation to the community leaders in the villages with whom we met and discussed wildlife conservation and from whom we derived the ideas retained for analysis in this report. They should rightfully claim the ownership of all of the contents in this report—our function was largely to perform the technical task of analyzing the feasibility of the suggested activities and present them on their behalf. Any errors committed in the report belong to the authors and not to any of the above-mentioned institutions or individuals.

SUMMARY, CONCLUSIONS AND RECOMMENDATION

A. SUMMARY

This study on emerging economic opportunities in Wildlife Management Areas (WMAs) has been a team effort between EPIQ consultants and the Wildlife Division (WD) of the Ministry of Natural Resources and Tourism. The topic is of keen interest to the WD because the revenues collected from hunting and tourism on the Game Controlled Areas (GCAs) must be shared with the local communities in the future. At the same time, it is probable that additional economic activities complementary with hunting and photo tourism will emerge for the local communities to pursue once the new Wildlife Management Areas (WMAs) become a reality. The key issue is whether the net revenues collected from additional sources by the both the local communities and the District and Central Government under the new system will be at least equal to, or exceed the net revenues collected from one source—trophy and resident hunting—under the old system.

The task before the EPIQ Team was to identify economic opportunities emerging as a result of WMA designation and analyze them from the perspectives of the local communities and the Government of Tanzania (GOT). The objective was to determine the economic feasibility of these opportunities. Feasibility was confirmed if the following criteria were met:

- The quantitative results meet or exceed the minimum standards set (i.e, that the net present value (NPV) is positive and the internal rate of return (IRR) is greater that the returns achievable from alternative investments associated with equal risk without any subsidies);
- the opportunities are consistent with the policy orientation of the 1998 Wildlife Policy of Tanzania (WPT);
- the opportunities are realistically implementable; and
- all opportunities, when implemented in the aggregate, will increase revenues for all stakeholders—the GOT, the districts, and the local communities.

Four major economic opportunities were analyzed out of a long list of some 14 opportunities identified. These were:

- Tourism (trophy) and resident hunting
- Photo (non-consumptive) tourism
- Improved beekeeping and collection centers for honey, beeswax and other beekeeping byproducts established as wholesale markets for the producers and for quality control purposes, and
- Natural forest management (NFM)

The literature review, fieldwork, and quantitative analysis for this study were carried out during the April 16 – May 14, 2000 period with the aid of an economic model constructed on EXCEL'2000. The model includes templates for all of the individual activities and in the aggregate from the perspectives of the Authorized Association (AA)

representing the local communities and the WMA, and the GOT (WD and the districts). The results generated by the model also show the extent to which the different stakeholders (the GOT, Districts, the AA itself, and the local communities) gain or lose as a result of the WMA designation.

Included among the variables in the model are the revenue-sharing arrangements needed to ensure feasibility among the individual interventions and in the aggregate. These sharing arrangements were also used as calibrating mechanisms in the sense that the WMA management structure—the AA—must be able to cover all costs in order to carry out its mandated tasks. These costs include not only the capital and operating costs of the AA itself, but also the contributions to the GOT, the Districts, and the local villages. The net revenues generated for the AA consist, first and foremost, of the portions of the block, game, and conservation fees previously collected by the government. As the AA now takes a percentage of these revenues, the GOT and District's revenues must decline correspondingly. To offset these declines, however, the additional economic opportunities identified in this study must generate new revenues for all stakeholders. These activities—photo tourism, beekeeping and collection centers, and NFM—must at least make up or exceed the shortfalls in revenues collected from hunting.

The results based on a hypothetical WMA of some 1,100 km^2 in size clearly showed that all of the criteria for feasibility were met by the opportunities analyzed. The main results are presented below.

Results: WMA Economic Opportunities

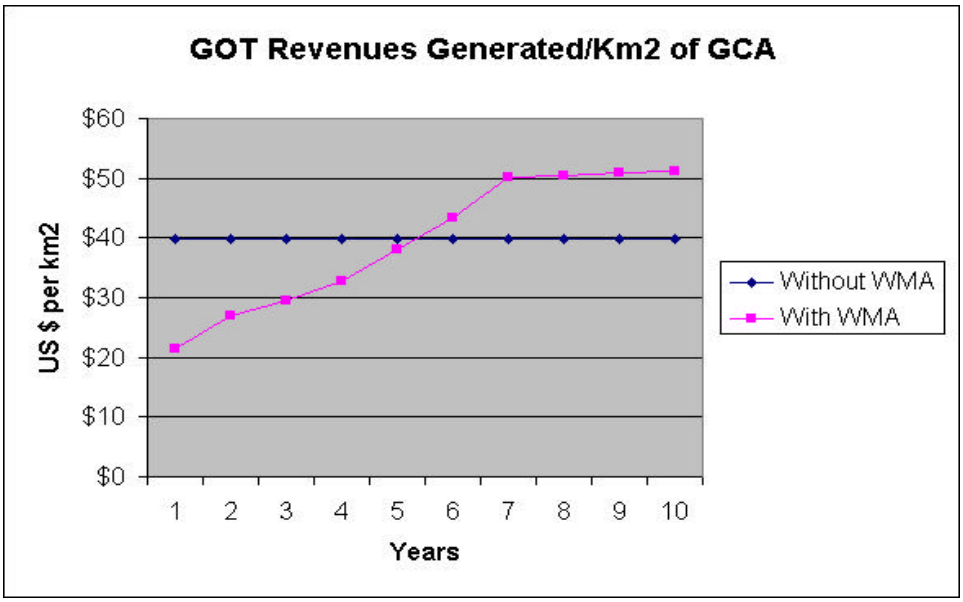
Opportunities	NPV at 25% TSh	IRR
WMA (AA) aggregate results	17,298,096	32.6%
Trophy and resident hunting	185,026,185	NA
Photo tourism	38,490,655	NA
Individual beekeepers	326,663	65.6%
Collection center, aggregate	8,370,337	34.7%
Natural forest management (NFM)	1,901,4791	NA

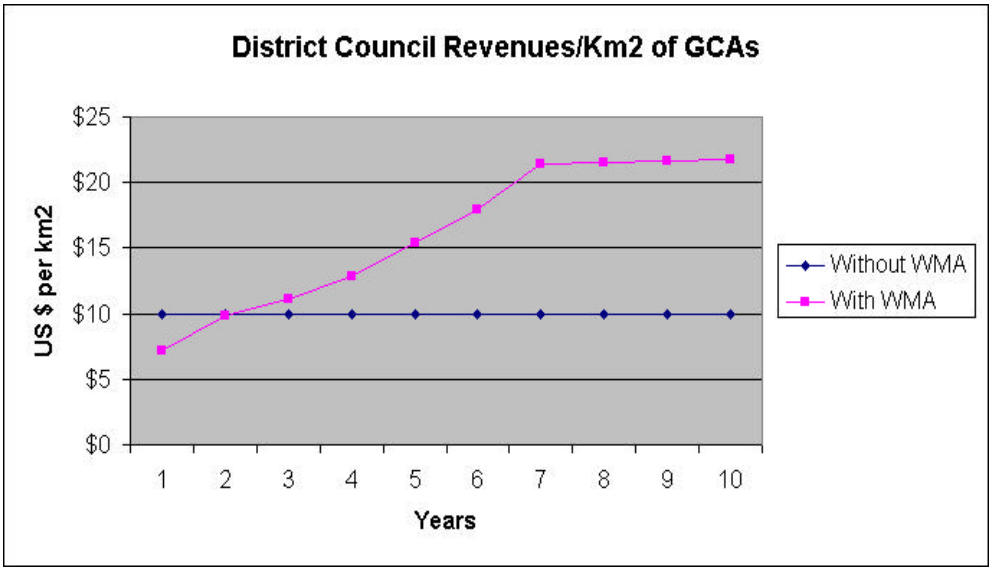
(Note: NA means not applicable—IRRs sometimes cannot be computed because all cash flows are positive).

All of the interventions analyzed are strongly feasible from the AA perspective as indicated by the results. From the GOT, District, and village perspectives, the main results are presented in three graphs below. Beginning with the GOT revenues, the results indicate that the revenue stream per km^2 of GCA with a WMA designation reaches parity with the "without" WMA designation in year 5, after which the revenues will increase by more than 25 percent—from \$40 to \$51 per km^2.

The second graph shows that the breakeven parity is reached in year 2, after which the revenues collected "with" overtake the revenues "without" WMA designation. In short, the increased revenues collected from the other activities—photo tourism, beekeeping, and NFM—more than offset the reduced revenues collected from the hunting

activities. The key finding here is that the broader base of income- generating activities on the same area allows the government to collect more revenues than was possible from the hunting activity alone, even though the percentage of the revenues collected from hunting has decreased.





Both of the above graphs show the "with" and "without" WMA scenarios over time, holding the GOT and district revenue streams constant at the $40 and $10 per km^2, respectively. The implicit assumption here is that the same level of revenues will be generated in the future as has been generated in the past. This is not an unrealistic assumption since the revenues are based on a fixed number of hunting blocks (their size and configuration rarely change), fixed game fees, and a fixed annual permit for the right to the concession. These fixed prices have not changed for several years and there is no evidence that they will change in the future. Hence, the projection of GOT/district revenues are straight lines under the "without" WMA scenario.

The last graph shows the extent to which the WMA designation can directly benefit the villages. The AA will operate as a for profit institution in terms of its WMA management; i.e., the activities (economic opportunities) included for AA support must be proven to be financially and economically feasible. In its function as representing the villages, however, the AA operates as not-for-profit institution in the sense that excess cash flows over and beyond the costs of managing the WMA could be siphoned off to fund community development projects, or used as a source of credit for individual farmers, or simply distributed to the villagers in the forms of cash dividends. It will be for the AAs to decide how these funds should be allocated. The net revenues generated are far in excess of what the local villages currently receive as a matter of routine budgetary allocations from the District Councils, and possibly from village-level economic initiatives, if there are any.

If the AA manages the WMA in accordance with the Guidelines, then, by

definition, the results will also be consistent with meeting other development and policies as well, namely: a) the WD policy of wildlife conservation, b) the forestry policy of sustainable forest management, c) the Forestry and Beekeeping Division's policy of increased and improved honey and beeswax production, and d) the Tourism Division's policy of providing quality tourism experiences for visitors to Tanzania. The NGO community involvement in the wildlife sector should also be highly supportive of this development for the same reasons.

B. CONCLUSIONS AND RECOMMENDATIONS

Conclusion 1: The overall conclusion drawn is simply a strong affirmation of the recently adopted WPT and WMA concept soon to become reality. Devolving the management of wildlife to the local communities under WMA designation *will* increase the economic well being for all stakeholders—the GOT, the Districts, and the local communities. In fact, the implementation of this option is probably the only realistic avenue available to the WD given its lack of adequate funding to carry out its mandated task to conserve wildlife and its habitat.

Recommendations pertaining to Conclusion 1:

The successful implementation of the WMA concept, however, is fraught with constraints and caveats that must all be resolved before declaring victory. Some of these are listed below along with recommendations on how to address them:

1. In most rural communities, the capacity for planning and managing business enterprises is very low—there is a legacy of failed communal enterprise initiatives in Tanzania. This is not insurmountable, however. The focus must be on the structure of the AA—the needed expertise must be hired from the *outside* while local capacities are being continually strengthened (see **Chapter 3**). The recommendations are as follows:

   - The WMA Guidelines and legislative framework should reflect that the AAs are free to hire the best and most competent management expertise to be able to manage the WMA to the maximum benefit of the local member communities within the constraints imposed by the Guidelines. Such a structure is costed in the modeling framework developed for this study.

   - Stakeholders should meet in a series of workshops (with donor involvement) before startup intended to build partnership cohesion and transparency into the WMA creation and operation process, and to identify technical and other support topics in which the intended providers of technical services must be retooled.

2. Although the Guidelines will specify what will and will not be allowed under a WMA designation, the AAs, the supporting NGOs, and the GOT stakeholders in the wildlife sector must receive considerable training in how to maintain a proper

balance between wildlife and natural resource conservation and economic objectives.

Conclusion 2: Although the results indicate that the economic opportunities analyzed are strongly feasible, there is a gap of some four to five years during which the revenues collected with WMA designation by GOT stakeholders fall short of the revenues collected without the WMA. It is noted, however, that these results were obtained using very conservative assumptions—less conservative assumptions will shorten the gap. Nevertheless, the revenue gap may, by itself, prove to be the downfall of WMAs unless due attention is paid to this particular problem early in the process.

Recommendations pertaining to Conclusion 2:

1. The GOT should seek bridging support to cover this period of revenue shortfall. Herein lies an excellent opportunity for the donor community (*because* WMA designation fits perfectly with the conservation, poverty alleviation, governance, gender, and sustainability agendas of most donors as clearly articulated in their policies for assistance). The assumptions made in the model for the base case analysis included staggering the activities to ease the AA management burden during the early years. This means that the revenues generated from some activities are delayed for up to four years with corresponding impacts on the feasibility results. If the donors were to support the AA with training, technical assistance and other support, however, it would be possible to launch all activities during the first year while actively looking for more activities to add to the portfolio much earlier. In this way, the AAs would be capacitated to manage effectively sooner than later and the net cash flows would be such that the gap could be substantially shortened. Moreover, it is also essential to generate positive cash flows early on to make sure that funding will be available for the villages. A delay of several years before this occurs can derail the process resulting in increased poaching.

2. The four- to five-year net revenue gap is not only attributable to the AA capacity limitations, it could also be attributable to *initially* poorly developed markets (for honey, beeswax, charcoal, etc.), poor quality products, and inadequate infrastructure. It takes time for product quality to advance from poor, to adequate, to superior, before markets emerge and supply regularity become well entrenched. Not only is this a matter of investing in the value-added equipment and the like, it is also a matter of working more effectively and producing better products and/or services as a result of capacity building. To this end, it is recommended that:

   - programs in management, marketing, accounting and economics be launched (perhaps with donor support);

   - producers (of honey and related products, fuelwood and charcoal, and other products) and prospective buyers should arrange to meet for the purpose of discussing regularity of supply, prices, and product quality specifications; and

- investments required by all stakeholders (GOT, NGOs, AA, and individuals) be identified and costed throughout the entire marketing and distribution chain.

Conclusion 3: Although the results indicate that the economic opportunities analyzed are strongly feasible, this is only the beginning, or probably the low end of the net benefits that a WMA designation will be able to generate. The EPIQ Team identified several economic opportunities in addition to those analyzed. These were not included simply because the Team did not have the time nor resources to carry out the needed field visits to document the opportunities in detail. These and other opportunities are real and will likely be highly applicable in many potential future WMAs. With the analytical approach developed here, it would be a simple matter to add the analysis of opportunities as they emerge. Given the above criteria for feasibility, any new opportunity proven feasible will, by definition, add to or further strengthen, the aggregate feasibility results reported here.

Recommendations pertaining to Conclusion 3:

1. The Guidelines specify that all economic opportunities should be subjected to financial and economic scrutiny by the GOT and NGO stakeholder community before being accepted as worthy of support. The present study, funded by USAID/EPIQ, is the first such attempt. The Team was told that the capacity within the stakeholder community in Tanzania to carry out such analysis is low, however. The recommendation, therefore, is that the WD, TANAPA, and other GOT stakeholders agree to prioritize capacity building in this area and to approach the donor community for the needed support.

2. The modeling framework developed for purposes of this study is a significant beginning. It was, however, developed only in order to generate this report. It is recommended that the model be transformed into a user-friendly tool that WD and others will be able to use directly for decision-making and monitoring. Once the users input credible data, the outputs will provide a reasonably accurate indication of whether the economic opportunity being tested is financially and economically worthwhile. User friendliness simply means that the user will be fully apprised of the meaning and significance of the variable as he or she specifies the inputs, and the results. In its current form, the model contains much more information than is reported in this current document. Additions and modifications to the model could be funded on an as needed basis.

3. Once the current modeling framework has been transformed into a user-friendly version, additional funding should be sought for training in how to apply the modeling framework, including the fundamentals of financial and economic analysis.

C. A FINAL NOTE

Some SOW requirements were not addressed directly by the EPIQ team for a number of reasons—chief among them was lack of time and the nature and scope of the particular SOW requirements. The main unresolved task in the SOW was the requirement to.."focus on the levels of acceptable use (carrying capacities) for hunting (in terms of the behavioral patterns of the wildlife, the species to be hunted and the quotas per hunting party), tourism (in terms of the maximum number to tourists to be allowed in a given area at a given time), and other economic opportunities related to CBC activities, as appropriate." Also as stated in the SOW: "Both hunting and tourism are subject to carrying capacities that must be estimated. Unconstrained hunting will soon deplete the wildlife in the area. Likewise, unhindered tourism may affect wildlife behavior and/or the cultural integrity of the local communities."

Estimating the carrying capacities for hunting and tourism was far beyond the time and resources available to the team. First, carrying capacity can only be estimated for specific sites with known ecological, economic, and demographic realities. The analysis presented in this report is based on a hypothetical WMA with *assumed* values for these parameters. When real WMAs are gazetted, however, the land use plans must be based on carefully structured socio-economic resources assessments, including carrying capacities in defining the economic opportunities, analyzing them, and setting the development targets.

CHAPTER 1: INTRODUCTION

1.1 Background

As stated in the Scope-of-Work (SOW) in **Annex 1**, the "…implementation of the Wildlife Policy of Tanzania (WPT) and the creation of Wildlife Management Areas (WMAs) will open the door for a number of enterprise opportunities for the local communities that now benefit little from the presence of wildlife in their areas. Although it is *expected* that WMAs will benefit the local communities in different ways, little is actually known about which kinds of opportunities exist, or the costs and benefits of these opportunities. Clearly, the legislative texts and by-laws that will provide guidance on how to manage the WMAs, including the rights, responsibilities, and revenue-sharing formulas will greatly help define what the opportunities are and their parameters. Rigorous analyses of their costs and benefits and feasibility from the perspective of the communities, however, still remain to be done."

Hunting and tourism are obvious possibilities because the areas for the WMAs will be drawn from the currently Game Controlled Areas (GCAs)[1] and village lands where the tourist hunting companies are currently operating and some (currently illegal) photo (non-consumptive) tourism is taking place.[2] Many additional opportunities will need to be explored once these areas are transferred to local control, however. These include complementary activities such as beekeeping, natural forest management (NFM), thatch gathering and marketing, game meat and hide sales, fisheries, and many site-specific opportunities that will emerge once the WMAs are gazetted and the resource base is better known. This report only begins the process by analyzing a few obvious opportunities the EPIQ Team believes to be generically applicable to all WMAs in one way or another. Finally—the main prerequisite for any of the economic opportunities discussed and analyzed in this report is that all sectoral policies (beekeeping, forestry, wildlife, fisheries, and others) be fully harmonized to ensure that implementation under WMA designation will be successful.

The report has an **Executive Summary** with conclusions and recommendations and four chapters. **Chapter 1** provides an overview of the problems from the perspectives of the GOT and the local communities, the objectives, the key issues and a summary of the analytical approach taken. The potential WMAs and the global economic opportunities are discussed at some length in **Chapter 2**. All of the analytical assumptions are laid out in detail in **Chapter 3** for the opportunities short-listed for analysis. **Chapter 4** summarizes the results of the analysis by individual producer (i.e., the beekeepers, the collection centers, etc.) and in the aggregate. The terms-of-reference (TOR) are presented in **Annex 1**. The individuals and institutions met are summarized in

[1] All land other than Protected Areas (PAs) and Game Reserves ultimately belong to the villages, although not all other land is gazetted as such. Some ungazetted land is referred to as public land. The GCAs are located on village and/or public lands.

[2] Under current law, hunting blocks cannot be allocated to hunting and photo tourism at the same time. Some very limited possibilities for this to occur under WMA designation, however, are analyzed in **Chapter 4** of this report.

Annex 2. Finally, **Annex 3** contains largely unedited field notes from meetings and observations.

1.2 Perspectives and Objectives

Although Tanzania probably is one of the richest African countries in terms of wildlife resources, wildlife has been under constant threat for a number of years. Large areas are impossible to police and some important wildlife species are being lost or severely reduced in number. This is a matter of serious concern, given the fact that the country's economy is largely based on natural resource utilization and extraction. The WPT (1998) attempts to remedy this situation by devolving the management of the wildlife resources to the local communities through the establishment of WMAs. The aim is to achieve conservation through the participation of local communities and to share the benefits with them. Conservation must pay for itself, otherwise it will not happen.

This section presents the GOT and local perspectives on the WPT and WMAs, followed by a brief summary overview of the objectives addressed in the study. The discussion sets the stage for the analysis of economic opportunities emerging as a result of WMA designation, which, if realized, could substantially increase revenues accruing to *all* stakeholders—the GOT, the Districts, the AAs (managing the WMAs on behalf of the local communities), and the investors in the different economic opportunities.

A final note—it is important for all stakeholders to recognize early on that the economic results will vary between different WMAs. Some will be well endowed with wildlife and other resources, others less so. Implementation of the different economic opportunities will, therefore, generate different measures of profitability. The WMAs will *not* be equally profitable.

1.2.1 The GOT Perspective

The perspective is fairly simple—the GOT does not have the financial resources to properly manage the vast GCAs. Although the WD may be staffed with well-educated, competent and motivated people, they are far too few, particularly the field personnel, to be able to carry out its mandated functions. In economic terminology, the wildlife conservation production function would be much better served with a different mix of inputs—namely, using local communities to manage the wildlife resources in exchange for sharing of the revenues generated. Of course, the other (and perhaps more powerful) rationale is the growing recognition that the old style of command and control and exclusion of local people are no longer viable policies given the growing pressures on the resources and attendant emerging land use conflicts. These, in a nutshell, form the GOT perspective as reflected in the WPT and the Guidelines for the WMAs.

Other GOT institutions such as the Forestry and Bee-Keeping (FBD) and Fisheries Divisions, are also promoting various forms of Community Based Conservation (CBC) approaches. The Vice-President's Office (VPO), through the Division of the

Environment (DoE), has issued policy statements addressing the issues of conservation, sustainable utilization of natural resources, community participation and extending benefits to local communities. The VPO is also mandated to address the critical issue of poverty alleviation in Tanzania, an issue closely linked to environmental quality because poverty is an underlying cause of overuse and depletion of natural resources. The 1997 National Environment Policy (NEP) states that environmental degradation leads to widespread poverty; equally important, poverty is a cause of environmental degradation as it undermines people's capacity to manage resources sustainably. Local Government Authorities (LGA) through the District Councils (DC) should also be in agreement with the proposed changes of creating locally managed WMAs (as called for in the WPT). They too are mandated to conserve the resources within their jurisdiction to sustain local incomes in perpetuity, but have little capacity and funding to make this happen. They must clearly understand that they will *not* lose revenues with WMA designation, but gain even higher revenues and employment as the economic base widens with implementation of the additional economic opportunities under a WMA designation.

These efforts on the policy front clearly point to a growing acceptance of the CBC concept in Tanzania—the need to change the input mix in how the nation's natural resources are managed. Not only is the focus on the natural resources—the wildlife in this case—but also on the role of the natural resources in poverty alleviation. The critical elements of sustainability of natural resource use and addressing local livelihoods are central to overall GOT development objectives. Moreover, the GOT is integrating environmental concerns and economic development as agreed in the Rio Declaration and Agenda 21. The Agenda also places emphasis on participation and addressing the interests and concerns of local communities.

The GOT has, over the past five years either revisited all policies relating to conservation and the environment, or has devised new policies that address the critical management issues facing the natural resources sub-sectors. These include, among others, the WPT (1998), the Environment Policy (1997), the Forestry Policy (1999), the Tourism Policy (1999), and the Beekeeping Policy (1998). Common threads in all of these are to: a) utilize Tanzania's natural resources efficiently and sustainably, b) include local communities in the process, and c) address issues of increased benefits accruing to local communities. All of this adds up to a much stronger people orientation in expressed policies than ever before. The stage is set for a successful implementation of the WMA concept on nearly all fronts. What remains to be accomplished is strengthening local capacity to effectively implement the concepts so that people and government institutions become true partners in conservation with benefits accruing to both.

A final note—the analysis carried out based on the assumptions listed in **Chapter 3** is from the perspectives of the AA and/or individual investors in the economic opportunities. As such, it includes the investment and operating costs for these enterprises only. The GOT and district perspectives, on the other hand, are represented by the differences in revenues they receive with and without WMAs, exclusive of any investments the government institutions may need to make. It is anticipated that the GOT investments required will be minimal, however. According to the Guidelines, the role of

WD, TANAPA, and other government institutions will be to provide technical services to the AAs and the local communities to ensure that the WMAs are managed in accordance with the WPT and the WMA guidelines—this requires changing job descriptions, retooling and capacity building, not infrastructure and investments in additional personnel.

1.2.2 The Local Community Perspective

The Game Controlled Areas (GCAs) include some of the richest concentrations of wildlife left on the African continent. Human population growth and competing land use pressures have placed many of the GCAs under greater and greater threat, however. The fundamental problem is that the local communities adjacent to the GCAs receive little or no benefits from the wildlife on these lands. Consequently, they have little incentive to conserve the wildlife or the habitat on which the wildlife depends. Nearly all people in the GCA communities make their living from economic activities other than wildlife. Chief among them are herding and agriculture. Conflicts between farmers and wildlife are much more acute than between herders and wildlife. They are also increasingly commonplace. If more people in the local communities were to earn higher incomes from wildlife-related enterprises, the pressures on the resource base would be reduced. Currently, extensive farming practices reduce the wildlife migratory routes, which lead to a higher incidence of crop damages caused by problem animals and pastoralism.

The new WPT (1998) makes it possible for the communities in the GCAs to organize themselves into Authorized Associations (AAs) and to obtain the rights to control and manage all of the biological resources, including the game, of the WMAs to be created according to the draft Guidelines. The WPT specifies that the decisions to form the AA and the WMA must be fully voluntary on the part of the communities. The overriding challenge is to create the conditions to bring this about. These include:

- The program must be designed with incentives sufficiently attractive so that local communities will chose to apply for WMA designation over other alternatives (such as converting the old GCAs to agriculture). Sustainable management of wildlife and other renewable natural resources must be a more attractive option than other land uses, particularly in the agriculturally marginal areas.[3] Equally important, the strategy devised by the local communities as background for the WMA application must include all stakeholders, including proposed schemes to compensate stakeholders likely to lose as a result of a WMA designation.

- The procedures and guidelines for the creation of WMAs and AAs must be simple and straightforward. The time elapsed from initial application to the creation of an operational WMA must be kept short to ensure that the candidate communities do not abandon the process.

[3] Agriculturally productive areas will likely already be in production and will rarely be included in the WMA application.

- The local communities inside the GCAs must be granted use rights over the wildlife and other natural resources (the woodlands, for example) under a WMA designation. Currently, they have no such rights and are not legally entitled to receive any benefits—wildlife belongs to the government. The local communities have little incentive to protect or conserve wildlife and they frequently poach animals or invade forests for their own consumption or for the local markets.

- WMA designation must promulgate a system of village self-policing of poaching activities in collaboration with the hunting companies. Under current WD guidelines, hunting companies are supposed to undertake anti-poaching activities in the GCAs. As several of the poachers are local villagers, this places the hunting companies in a conflict relationship with local people.

1.2.3 Objectives

Three main objectives have been formulated for this study—the 1st two respond to the initial TOR, the 3rd was added later following meetings with different stakeholders:

- To identify the principal economic opportunities to local communities emerging as a result of WMA designation of their village lands.

- To determine the financial and economic feasibility of these opportunities from the AA and GOT perspectives.

- To suggest modifications, as time permits, to the draft WMA guidelines, based on lessons learned and experiences from other countries.

1.3 The Key Issues

Several issues that need to be resolved during the process of progressively moving WMAs from concept to reality are briefly listed and discussed below. These emerged from field interviews and the literature. The same issues were raised repeatedly. Some informants were cautiously optimistic about their resolution, others less so. However, all agreed that devolution of responsibility and authority for managing wildlife to the local communities is essential. The key issues listed included the following:

- How can the requirements and procedures for receiving WMA status be made as simple and straightforward as possible so as to encourage communities to form WMAs?

- How can the socio-economic incentives be increased to encourage communities to collaborate to form WMAs and ensure sustainable use of wildlife and other natural resources of the WMAs?

- How can proper incentives be identified and put into place to ensure that critical wildlife migration corridors are maintained through the creation of WMAs or other appropriate designations?

- What are the most critical types of capacities that need to be built within the AAs to properly manage the WMAs and what should be the strategy for building them?

- How do we ensure that hunting quotas are based on good biology (inventories), and how do we ensure that quotas are respected?

All of these issues are addressed in different ways in the financial and economic analyses that follow. Partial responses to all of them relate to whether the economic opportunities prove to be feasible from the perspectives of both the AA and the GOT (i.e., a win-win situation). If that condition is met, the local communities will then know that the presence of more wildlife adds to their economic well-being more so than less wildlife. The major question in the minds of some is whether the GOT will truly devolve responsibilities for the management of the WMAs to the local communities as intended in the WPT. The devolution will entail a restructuring of all fees and licensing schemes—the revenue-sharing arrangements—because the local communities (represented by the AAs) will now assume the management role, for which they will have to be adequately compensated.

Shifting the revenues away from the GOT and the Districts to the local communities may be perceived by many to be a "zero-sum game" where the AAs and the local communities gain at the expense of reduced GOT revenues. If that perception prevails, successful implementation of the WMA concept as intended will be exceedingly difficult, if not impossible. Very simply stated, however, the WMA concept is far from "zero-sum". As local communities gain access to all resources in the WMA and the revenues that can be generated from them, not only will the wildlife population increase over time as villagers find it in their best self interest to promote this, many new and complementary opportunities will emerge as well. The size of the "pie" increases—it does not remain constant. It is probable, indeed, that the GOT will, in the end, collect more from the WMAs than it did previously under full central GOT control.

1.4 Analytical Approach

The analytical approach taken here is straightforward—it involves the analysis of the quantifiable costs and benefits associated with economic opportunities identified in this study to determine if they are feasible from the perspectives of the investors and the GOT. For the private investor, the criterion for feasibility is that the net present value (NPV) of the proposed investments must be equal to or greater than zero, and that the internal rate of return (IRR) equals or is greater than the opportunity cost of capital. For the GOT, feasibility is achieved if wildlife is conserved in accordance with defined sustainability parameters and the net revenues generated with WMAs equal or exceed the net revenues without WMAs in present value terms.

The main analytical perspective is the AA—the institution created and placed in charge of managing the WMA. Its membership will be structured in accordance with the Guidelines with elected officials to represent the villages. It will also function as a private sector for-profit enterprise responsible for implementing the different economic opportunities as efficiently as possible (as discussed in greater detail in **Chapter 2** below). The AA revenues will consist of the fees paid from incomes generated by the individual enterprises (beekeepers, etc.) created as a result of the WMA designation. These revenues must be sufficiently large to be able to cover the management costs of all of the activities specified in the land use plans (LUPs), including the taxes and fees paid to the GOT and the District Councils. Fees paid to the Village Councils will instead be paid to the AA since the latter fully represents the villages. Any excess of revenues collected over and beyond the costs of the AA managing the WMA *could be used* for development projects in the villages in accordance with priorities set by the AA "Board of Directors"—the elected body of village representatives—or simply be distributed as cash dividends to the local people.

1.4.1 The Model

A tailored analytical spreadsheet framework (EXCEL 2000) was developed for purposes of this study. Each proposed intervention was subjected individually to rigorous analysis based on detailed assumptions drawn from the literature or derived through field interviews. The first step is to determine the financial feasibility of the probable field activities—the income-generating opportunities from the perspectives of the intended beneficiaries (the local resource managers). The second step is to determine the economic feasibility of the project in its entirety from the perspective of the GOT. Four separate activities are identified (described in detail in **Chapter 2** below) and analyzed in this report. All were subjected to a preliminary feasibility test from the perspectives of the target beneficiaries—whether or not they would contribute to or detract from present levels of economic well-being. The end result sought is win/win—the GOT, district and local governments and the local communities increase their incomes and overall economic well being, and wildlife is sustainably managed.

1.4.2 Discussion

This study of a hypothetical WMA does not encompass an exhaustive list of economic opportunities associated with WMA designation for all of Tanzania. In addition to the obvious hunting and tourism opportunities, a WMA will probably create a wide array of other opportunities directly or indirectly related to wildlife, which will help reduce the pressures on wildlife. As people earn higher incomes in legitimate ways, their propensities to earn illegitimate incomes through poaching or other behavior detrimental to wildlife should decline, all else being equal. Among the many potential WMA sites in the country, some will be richly endowed with opportunities, others less so. All should be subjected to analysis to determine their full revenue-generating potential. The more opportunities opened with WMA designation, the greater the potential for generating incomes for the AAs. This study is only the first step in this process, analyzing a small fraction of these opportunities.

A major intent of this first economic opportunities study is to guide others—WD, TANAPA, NCAA, and NGOs—in how to carry out similar analyses in the future, where appropriate. According to the current draft WMA guidelines, these institutions will be responsible for carrying out the economic and financial analysis of economic opportunities as part of the WMA application process on behalf of the local communities, or the AAs. This particular aspect of the guidelines, however, needs to be revisited. The intended beneficiaries—the local communities represented by the AAs—should also participate in this process to ensure that their perspectives are fully represented. If others with explicit conservation agendas do so on their behalf, there is a real risk that the analyses will accommodate their agendas more so than the perspectives of the local communities. There will be a tendency to maximize that which conserves the most and minimize the obstacles to that end. It is entirely possible that some emerging economic opportunities may conserve less while generating more revenues for the local communities and still be within acceptable limits. Should these be included or excluded as options?[4] With full information available on all of the technical alternatives, the local communities may opt for more lucrative options even if conservation is compromised relative to the optimal. The important point to retain from this discussion is that the analytical approach must be as transparent as possible to prevent its use in support of one-sided agendas only. All perspectives must be represented.[5]

It is anticipated that substantial capacity building in the areas of financial and economic analysis will, in all probability, be required. The GOT stakeholder institutions, the NGO community, *and* the implementing institutions—the AAs—should all be recipients of the capacity building.

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[4] For example, the results may show that one alternative is non-consumptive tourism only, which increases local community incomes by, say 30 percent. Another alternative, however, may consist of seasonal non-consumptive tourism plus tourism hunting, which will increase incomes by 60 percent. The former may be perceived as best for conserving wildlife, the latter less so. Both, however, ensure that wildlife is sustained, although the first may have a lower margin for error than the second. An institution with an explicit conservation agenda may present only the first option and not analyze the second because it would be inconsistent with the perceived *optimal* conservation alternative.

[5] It is important to note here that the potential conflict of interest should not be taken out of context. Conservation organizations may be just as interested in economic development as others, but perhaps with a different set of opportunities in mind—such as a stronger focus on long-term than on short-term opportunities. The argument is simply that shorter-term opportunities, which an AA may favor, should not be excluded from consideration if they still fulfill the minimum agreed-upon ecological requirements.

CHAPTER 2: THE ECONOMIC OPPORTUNITIES

2.1 Introduction

This chapter sets the stage for the analysis by providing an overview of the global economic opportunities identified by the EPIQ Team based on time-constrained field observations in the Arusha and Iringa regions. The Team reiterates that these opportunities are probably but a small fraction of the full range of opportunities made possible through the emergence of WMAs in Tanzania.

2.2 Potential WMAs

It is assumed for purposes of this study that all GCAs are available for transformation to WMAs because all are located on village lands. These areas comprise some 58,565 km^2 according to WD statistics, divided into 44 GCAs on which some 122 hunting blocks are located. All of the GCAs are managed by the District Councils. In addition, hunting blocks are also located on the game reserves (117,000 km^2)[6].

If the WMAs are supposed to be created on the GCAs it would not be unreasonable to assume that perhaps 30 such areas of an average size of 2,000 km^2 could be created over time (or 60 areas of an average size of 1,000 km^2), if the local communities found it in their best economic interest to apply for WMA status. These potential WMAs will surely have many different economic opportunities to consider since they will be located in widely different climatic zones, far more numerous than the four opportunities short-listed and analyzed here. The following section lists a few global opportunities from which the four on the short list for analysis are drawn. Many others will emerge over time—all should eventually be subjected to financial and economic analysis.

2.3 Global Opportunities

The EPIQ Team sought first to identify the potential economic opportunities for WMA managers based on discussions in the field with different stakeholders. This "long list" is presented in this section from which several were eventually culled for lack of information and/or time to do additional analysis. Some of the economic opportunities identified are potentially viable to all WMAs, especially those based on wildlife. Others are site specific or market dependent and may only be viable under certain conditions. Most of the economic opportunities are already ongoing in some form in the existing GCAs.

[6] The fact that some hunting blocks are inclusive of both GCAs and game reserve areas may pose a problem in the future when the transformation into WMAs takes place. These hunting blocks will need to be re-gazetted to conform to the new boundaries, which may entirely change the current configuration of the existing hunting blocks.

The opportunities were identified through meetings with villagers, private sector operators, government officials, NGOs, and from background documents. One economic opportunity discussed below—natural forest management (NFM) for urban wood-based energy supplies—would be new to the GCAs, and perhaps, to Tanzania[7]. This particular opportunity draws from the Team members' experience with such enterprises elsewhere in Africa, especially in Sahelian West Africa. Most of the economic opportunities are compatible—they can occur on the same area at the same time—others are conflicting, as will be indicated in the discussions below.

To summarize, the following long list of economic opportunities were identified for the WMAs. Each was assessed and included in or excluded from the "short list." The opportunities are briefly described below:

- Tourist (or safari) and resident hunting
- Game cropping for meat, hides, and other products
- Live animal capture and sale
- Game ranching and farming
- Non-consumptive photo-tourism
- Beekeeping and value-added processing
- NFM for urban fuel markets and other wood products
- Fisheries management (for those WMAs that have streams and lakes with fisheries resources)
- Sustainable production of thatching materials (grass, palm fronds)
- Sustainable production of hay/livestock fodder
- Sustainable production of medicinal plants
- Range management for livestock production
- Mining
- Agriculture

It is important to note that many of these opportunities need not depend on a WMA designation before they can be implemented. Beekeeping, NFM, fisheries, fodder production, range management, mining, and agriculture, for example, occur now without any protective WMA designation. A WMA, however, is essentially a vehicle through which organization and management by the local villages (though the establishment of an AA) is mandated by the WMA Guidelines, otherwise a WMA designation will not be awarded. Although many of these activities are ongoing, they are *ad hoc*, poorly managed and largely devoid of marketing strategies, and without access to investment capital. A WMA designation will change all of this by adding organization, management, and marketing to the activities in accordance with strategic land use plans

[7] The Tanzania Energy Policy (1997) emphasizes the development of indigenous energy sources such as biomass, coal, natural gas, and hydro power (URT, 1997). Less than two percent of the energy development budget allocation is earmarked for wood energy, however. The reality is that a considerable opportunity to generate employment and income simultaneously with increased conservation through NFM is being neglected.

developed for the purpose of conserving the income-generating capacity of the resources in perpetuity.

2.3.1 Tourist and Resident Hunting

Hunting (tourism and resident) has been retained on the short list. Currently, villagers have almost no control over tourist hunting, and the benefits generated are limited to cash the hunting companies choose to give (they are not mandated to do so) directly to the communities to ensure their cooperation. A few hunting companies have established special programs to provide direct benefits for the villagers in their hunting blocks. Robin Hurt Safaris and Tanzania Game Trekkers (TGT) were among the first to establish such programs, charging their hunter clients a 20-percent surcharge on the game fees. This surcharge is dedicated to village development programs that the companies manage directly. Very recently, the WD has started including hunting company support to village development activities in their criteria for ranking hunting company performance. In addition, 25 percent of the game fees collected by government are remitted to the District Councils for supposed redistribution to the villages. Although villagers ultimately receive some indirect benefits in the form of routine public services, these are not linked to the 25-percent remittances to the District Councils from the hunting operations. The overall employment impact for the local communities in the GCAs is very small, limited to only a few guides or porters hired during the hunting season.

The sale of quota-based hunting rights to tourist hunting companies and/or resident hunting groups present the most immediate, and supposedly the principal, economic opportunity for nearly all of the potential WMAs. The WMAs are, by definition, areas rich in game animals which tourist hunters are willing to pay "top dollar" to hunt. Tanzania has some of the very best, if not the best, remaining, wild and natural game populations in Africa. A major advantage of hunting is that it generates considerable revenues right from the beginning with little or no investments needed by the AA—the resource is already present and available, it does not need to be produced. Hunting provides the economic framework onto which communities can expand and intensify their management into other areas. It can generate profits early that communities can and should reinvest into the other economic opportunities[8].

To be sustainable, however, consumptive use of wildlife must be based on good biology—on setting, and respecting, ecologically sustainable "quotas" for harvesting. These must be based on the biology of the game populations. Systems for monitoring the game populations, therefore, must be jointly developed and implemented by the WD and the AAs along with effective systems for enforcing the quotas. This includes controlling or limiting poaching. If these basic requirements are met and respected, and if the habitat is well maintained, then tourism and resident hunting will become very viable economic enterprises for the local communities, represented by the AA.

[8] One should not rule out that some areas *could* be designated WMAs even if the current incidence of wildlife there is low. Local communities could apply for WMA designation if their LUP objective were to reintroduce wildlife into the area to attract tourism/resident hunting and photo tourism.

2.3.2 Game Cropping

Game cropping has not been retained on the short list. Game cropping—the commercial harvest of wildlife for meat, hides and other products—is another consumptive economic opportunity carried out under permit issued by the WD. As above, cropping must be done within ecologically sustainable limits, or quotas. It is ideally used as a mechanism to ensure that certain species of wildlife do not exceed the carrying capacity of their habitat. The side benefits include game meat supplied to the communities and restaurants or butchers specializing in game meat, hides, and other animal by-products. These markets, however, are not yet well developed in Tanzania.

The Tanzania Wildlife Company (TAWICO) had a monopoly on game cropping in Tanzania until last year. The future status of this arrangement is uncertain because TAWICO is currently being privatized and the policy is under review. TAWICO pays the government a fee for each animal harvested and sells the meat, hides and other products in urban and rural areas. Game cropping has provided little benefit for local communities other than the occasional sale of fresh game meat at low prices. Cropping for fresh meat in remote areas also presents logistical challenges and may not be practical. Cropping for dried meat is much more realistic, although this would not fetch nearly the revenues that fresh meat would. Quality dried meat or "biltong", on the other hand, could be developed as a specialty product fetching much more attractive prices, but this would be a new and untested activity in Tanzania.[9] The Team's assessment is that game cropping for local markets will not compete well against tourist hunting or even resident hunting. If communities were free to choose between cropping for local markets and hunting, hunting will almost always be the more financially attractive economic opportunity.

2.3.3 Live Animal Capture and Sale

Live animal capture and sale has not been included on the short list. This activity, allowed under permit by the WD, could be considered an economic opportunity for WMAs in the future as related WMA associated activities emerge. About 20 companies are presently involved in the capture and export of live animals. Under present policies, these companies receive quotas for live capture from the GOT. Few benefits from this activity trickle down to the local communities. If appropriate policies were developed, AAs could consider this option along with the hunting and cropping options, or some combination of the three. Quotas for capture and sale of non-game animals (reptiles, etc.) could also be established for WMAs. If game farming or fenced game ranching is developed in the future, these enterprises could also be clients for live animal sales. Live animal capture could be a significant supplementary source of income for WMAs, although not a core activity. Further analysis of this option should be undertaken, including a realistic estimation of costs and benefits.

[9] Dried meat, or biltong, could be an activity with considerable potential in big cities—in supermarkets chains and other retail outlets. This is successfully done in Namibia.

2.3.4 Game Ranching and Farming

Game ranching and farming has not been included on the short list. This potential is being explored in detail in another EPIQ-funded study carried out concurrently with the economic opportunity study.

2.3.5 Photo-Tourism

Photo tourism has been retained on the short-list. Photo-tourism, meaning all non-consumptive tourism-related activities, presents a clear economic opportunity for some of the future WMAs. The actual potential will vary considerably, however, as a function of several factors. On top of the list is the requirement that photo-tourism eventually be recognized as a legal activity to co-exist with hunting. This can only occur on a *very limited* basis and under certain strict circumstances, as discussed below. Other factors include accessibility, proximity to other major tourist attractions (such as the Serengeti or Ngorongoro), the visibility of the WMA's wildlife and the presence of other attractions such as scenic vistas, etc. One of the main reasons for the increasing demand for photo-tourism development in the GCAs is that tourists can engage in walking safaris and night tours outside the parks (if permitted by the WD)—activities they cannot usually pursue inside the parks.

The compatibility of photo tourism with hunting is a key issue, however. There is vigorous agreement among hunting companies that photo-tourism and hunting cannot co-exist at the same time. The current law sides with the hunting companies on this issue. The photo-tourism companies disagree, however. If there is any middle ground, it is found in proper zoning of the WMA and only under certain limited circumstances[10]. One such circumstance is linked to the probable extension of the buffer zone around national parks from one to five kilometers. Where a WMA is situated directly adjacent to a national park, for example, small areas of a 5-km wide buffer zone around the park could be zoned for limited photo tourism to separate the tourists from the hunting blocks. Both users—the hunters and photo tourists—would have to obey the rules not to encroach onto the areas allocated to the other. Photo safari companies with small tented camps located well inside such extended buffer zones, whose guests remain inside the small gazetted photo tourism area and only access the camps through the parks, and only venture inside the park or protected area, would not conflict with hunting operations. These small gazetted areas would have to be off limits for the hunter.

The best example of photo-tourism development in the GCAs (albeit illegal) is around Tarangire National Park. Six photo-tourism companies have negotiated contracts with villages and have established permanent tented-camps near the park. As part of the contract with the villages, the operators have obtained use rights to an average area of some 2,000 hectares each. The villagers agreed not to clear any land for agriculture in these areas. These arrangements generate direct benefits for villagers reflecting the agreements negotiated on the fees paid to the communities per bed night sold. The more

[10] One suggestion that can help reduce conflicts between hunters and photo tourists is to have the same company sell both services.

bed nights sold, the higher the revenues for the villagers.[11] Field interviews conducted by the EPIQ Team suggest that villagers in this area view photo-tourism more favorably than tourist hunting because they can link the revenues generated directly to the tourists, rather than the revenues from hunting which go to the Districts first and then trickle down.

The conditions for each party (the hunting and photo safari companies) should be clearly spelled out in the lease contracts and be in compliance with Tanzanian law. It is important to reiterate, finally, that the potential for such joint activities is **very limited**, particularly in view of the fact that too many tented camps inside the buffer zones will hinder the free movement of the game between the protected area and the WMA hunting block. There will only be room for very few camps on carefully selected sites.

2.3.6 Beekeeping

Beekeeping has been retained on the short list. Traditional beekeeping is practiced widely in Tanzania, although the hives and equipment used are inefficient, beekeepers are poorly organized, markets are not developed, and the quality of the honey produced is generally low. The local communities currently benefit little from this potentially very lucrative occupation. According to the Permanent Secretary (PS) of the Ministry of Natural Resources and Tourism (MNRT) in the *Orientation Workshop on Beekeeping* (April 2000), less than four percent of the potential volume of honey is actually being produced. Most of the honey is produced for local consumption (as honey or as an ingredient in local beer making), less is sold in regional, national, or international markets. Processing of the honey is very rudimentary and the quality of most honey marketed is very low. Producer prices are consequently low.

Beekeeping and the value-added processing and marketing of honey, wax and other products, nevertheless, present a clear economic opportunity for most, if not all, WMAs. Nearly all future WMAs have the potential to produce large quantities of quality honey, beeswax and propolis—the three main products for which there are virtually unlimited international markets. Only the open, sparsely wooded grasslands of some future WMAs in the north have little potential for honey production. The biggest constraints, and therefore, the biggest opportunities, are in processing and marketing. Improved processing and marketing presents a natural resource-based business opportunity for the AA of the WMA compatible with all other economic opportunities. It will also contribute substantially to the regeneration of the natural forests, complementary to the NFM activity (see below).

[11] The presence of photo-operations near Tarangire National Park is contested by both WD and the hunting companies. The WD stance is clear—the photo tourism operations are illegal. The hunting companies argue that photo tourism and hunting cannot co-exist on the same area at the same time.

2.3.7 Natural Forest Management (NFM)

NFM has been retained on the short-list. NFM for urban woodfuel (fuelwood and charcoal) markets has developed into functioning community-based enterprises in the dryland forests and shrublands all over West Africa. Although this approach is still in its infancy in Tanzania, the EPIQ Team believes that it presents a clear economic opportunity for many of the future WMAs. As in most developing countries, fuelwood and charcoal consumption in Tanzanian households, in the cottage and food processing industries, hospitals, and in the prisons and military establishments is high because they comprise the least expensive energy source available. Alternative fuels, such as LPG and kerosene are too expensive for the majority of people and most energy consuming institutions. All WMAs that fall within the present fuelwood and/or charcoal supply zones of urban centers or other markets probably have the potential of managing their dryland forests for these very substantial markets. The closer a WMA is to the market, the greater the economic opportunity.

Dryland forest management typically consists of dividing the forest to be managed into a number of cutting units of approximately equal size and potential. One unit is harvested each year through selective cuts that favor the growth and regeneration of the higher valued species and trees. This may include favoring trees that are especially important for wildlife, for honey production, or for other uses and services. The number of cutting units often runs from 6 to 15. After the full 6- to 15-year rotation, one starts again to selectively harvest the first cutting unit on a rotational basis. Other higher valued products such as posts, poles, small sawlogs and non-timber products can also be produced depending on local conditions and markets. Early controlled burns are often an integral part of the management systems.

The present, unmanaged exploitation of dryland forests for charcoal in Tanzania appears to be a major environmental problem facing the country. Based on limited field observations, the exploitation is a classic form of high-grading the forests, which continually degrades the value and the quality of these ecosystems. The charcoal supply zones for Dar-es-Salaam and Arusha already overlap. Charcoal is currently being transported over 450 km to Arusha and more than 220 km to Dar-es-Salaam. Properly implemented, NFM through selective cutting for woodfuel production could substantially increase the value of the forest while ensuring a sustainable supply of essential biomass energy at reasonable prices, while simultaneously improving the wildlife habitat in the WMAs. This opportunity is particularly relevant to the Arusha wood-based fuels market. The present policy excludes fuelwood from natural forests from this Arusha market—all fuelwood must come from exotic plantations, mostly pine, cypress and Eucalyptus. Pine and cypress are both very poor fuelwood species. A regional forester in Arusha told the Team that “No one in Arusha would use these species if they could get acacia fuelwood”. Managing acacia woodlands and other dryland forest types for fuelwood production would have the environmental advantage of having to cut less forestland to produce the same amount of energy in calorific terms.

There are also significant fuelwood markets for drying tobacco as well as local markets for towns, villages, fish drying, brick-making, military camps, educational institutions, and hospitals, etc. The GCAs closest to the Tabora area tobacco farms would probably find a ready market. Based on field interviews, the Team has learned that NFM would, in all probability, be compatible with most other economic opportunities in a WMA, including hunting so long as the harvesting activities are coordinated with the hunting activities. Fuelwood production would also have the advantage of generating considerable local employment. Charcoal making is a much more specialized occupation—itinerant charcoal producers would require a much higher level of supervision than village fuelwood cutters or charcoal makers.

Although only partial information was obtained on the benefits that presently accrue to local communities from fuelwood and charcoal production activities, it can safely be concluded that they are quite small for the following reasons:

- The trees harvested and converted to charcoal by the professional charcoalers are a free good—no stumpage fee is paid. Although both the village and District Council levy taxes on the charcoal produced, nothing is invested back into forest management.

- Woodcutting for charcoal is done as a high-grading operation. Only the best species of the optimal diameters are used. There is no management plan for the woodlands being harvested and nothing is done to ensure regeneration of these stands. The impact of charcoaling on the quality of wildlife habitat and the quality of the area as range for livestock has not been quantified.

NFM will probably need to be developed with donor support to properly adapt the key principles developed elsewhere to local conditions in Tanzania. NFM is relatively complex compared to some of the other economic opportunities and requires the development of considerable local capacity and investment of time to be successful.[12]

2.3.8 Fisheries Management

Fisheries management was not included on the short-list, because: a) the Team did not visit any areas where fisheries could be considered, b) it is totally dependent on local resources, and c) it is not directly linked with the central focus on wild animals and their habitat. Fisheries management and value-added processing, however, presents an economic opportunity for those WMAs that have lakes or streams with fisheries resources. Community-based fisheries management tends to be relatively simple. It requires empowerment of the local community in the control over the resource, the development of rules regulating net size, type of equipment used, the protection of spawning areas, etc. and a system for enforcing these rules. It also presents opportunities for the AA to invest in value-added processing (smoking, drying, refrigeration) and marketing; and, in this context, it would also link to the NFM component to ensure a

[12] The NFM opportunity is only analyzed from the perspective of the AA, not the woodcutters. Therefore, only the fees per stere cut and paid to the AA are counted as revenues.

steady supply of fuelwood. Fisheries management should be considered in the future for WMAs where this opportunity is obvious.

2.3.9 Sustainable Production of Hay/Livestock Fodder

Production of hay and fodder was not included on the short list. In some WMAs the sustainable production of hay and livestock fodder may be a potential opportunity so long as cash markets for hay or fodder could be developed and organized, especially markets in or close to urban areas. WMAs located close to Arusha and/or the Kilimanjaro region, for example, could consider producing hay and fodder for markets already established in these regions, primarily for the purpose of improving the quality of the herds. The team found no indication that this potential is very large, however.

2.3.10 Sustainable Production of Medicinal Plants

Production of medicinal plants was not included on the short list. Clearly, the availability of medicinal plants will always be of high priority for rural dwellers as commercial medicines are in short supply and/or they are too expensive. The production of these plants is, indeed, another potential economic opportunity because traditional medicines are naturally produced in the GCAs. There may be considerable potential for managing WMAs for some of these products if, as above, markets could be developed and organized. Identifying such opportunities, however, would require much more time than was available to the Team. Although the opportunity is not short-listed, it should be included as an important management tool for the NFM scheme; i.e., the protection of high medicinal value species. Once markets for the traditional medicines have been developed and are functioning, the opportunity should be added to the portfolio of activities to analyze.

2.3.11 Range Management for Livestock Production

Range management for livestock production was not included on the short list. The Team feels strongly, however, that range management will emerge as a critical factor in the allocation of WMA land, particularly in Maasai land, but also in other areas where herding is a dominant activity. Although livestock production in the GCAs can and does coexist with wildlife to an astonishing degree, the competitive pressures between the two will, without doubt, continue to intensify in the future. This activity could develop into a major opportunity in the future because all potential future WMAs are currently used as range by pastoralists, especially in the north, but also increasingly in the central and south west regions of Tanzania. Range and water are the two key resources on which the pastoral economy is based. However, in traditional pastoral systems, the range resource is rarely traded in the market or assigned direct economic values. It is, more often than not, exploited as a free good, an open access resource. The end result is severe over-grazing. The range is diminished yet further as agriculture expands—the pressures on the remaining rangelands intensify and declining productivity, decreasing soil cover, and erosion are the inevitable results.

The economic opportunity is too complex to define with the limited resources available for this study. The rangelands would have to be managed as an economic resource for and by the pastoral people in the WMAs and as a resource whose management is key to the other economic opportunities of the WMA. This would be contrary to the traditions and customs of the pastoralists—a formidable task to resolve, indeed. With the limited time available, the Team did not gain a clear understanding of the possibilities for successfully integrating rangeland management with wildlife and/or NFM schemes.

2.3.12 Mining

Mining was not included on the short list because the Team did not have an occasion to visit potential sites with proven mineral deposits. Mining has become a rapidly growing economic activity in Tanzania because of the high returns obtained from gemstones, Tanzanite, diamonds, gold, or other minerals. Alongside with tourism, it is a priority sector in economy. Since mining usually takes place on village land, and, hence on potential WMAs, there is concern in the conservation community that the sector will always get priority over other land uses such as wildlife conservation—the two are not complementary. Areas rich in both wildlife and minerals, therefore, may not become a candidate for WMA application because the local communities would prefer to exploit the minerals rather than manage the wildlife. As with photo-tourism and hunting discussed above, the potential for hunting and mining to co-exist is also very limited. If the proposed mining operation is not extensive, however, it may co-exit with hunting under proper zoning arrangements, including carefully planned access to the mining site so as to minimize the disturbance to the hunting, and the timing—when, during the hunting and off-season, mining operations can be carried out, and when they cannot. Future consideration of mining operations on WMAs must involve village and District authorities, the Commissioner of Mines, and the WD in the decision-making process. In addition, any proposed mining venture must be subjected to an environmental impact assessment (EIA).

2.3.13 Agriculture

Agriculture was not included on the short list. Agriculture is not forbidden in the GCAs, although it is stipulated in the draft Guidelines that agriculture will not be allowed in the WMAs. In some areas, clearing for agriculture is increasing at a rapid pace. Under the prevailing situation, the incentives for community members or for immigrants to clear land for agriculture are great and the disincentives are small. Conversion to agriculture represents the greatest single threat to the potential for establishing WMAs as commercially viable enterprises in the GCAs. Moreover, as most of this agriculture is “slash and burn”, in just a few years’ large tracts of woodlands and forests will be lost. In turn, this will change the ecology of the area for sustaining certain species of wildlife. The opportunity costs may be very high. In the future, intensified agriculture on lands already under cultivation could be considered an economic opportunity intended to reduce the pressure for clearing land illegally inside the WMAs.

A final note—four economic opportunities were retained on the short list and subjected to analysis: a) trophy and resident hunting, b) photo tourism, c) beekeeping and collection centers, and d) NFM. These were selected simply because the first two were prominently included in the TOR, and perhaps more importantly, because of the limited time and budget available to the EPIQ Team. The field visits were also structured to elicit information on these opportunities, the others had not been attempted in any of the projects visited, although some of them were on the lists of things *to attempt* in the future.

CHAPTER 3: ASSUMPTIONS

3.1 Introduction

This chapter provides a detailed listing of all the assumptions used in the analysis of the four different economic opportunities on the short list. These assumptions were developed from a number of sources—some from the literature, many from the field interviews conducted by the EPIQ Team, and most from a combination of the two where the assumptions are adapted to be conservative. The analyses are made of a hypothetical WMA since none have been gazetted—there are no WMA case studies readily available to document. As such, the results are also hypothetical because they are not linked to a specific site. The greater value of the effort, therefore, lies more in the details of the analytical process (how opportunities should be analyzed, from whose perspective, and the extent to which they contribute to the economic well being of the local communities) than in the exact magnitudes of the results. Indeed, the results presented have considerable value—they will show that beekeeping and NFM are profitable enterprises given the assumptions, for example, but the results will not be equally applicable for all WMAs in all corners of Tanzania. Some WMAs should not undertake beekeeping for a variety of reasons (distance from markets, poor flowering seasons, etc.), whereas others will for different reasons. In some WMAs, fisheries or thatch gathering would be much more attractive activities than beekeeping or NFM. All WMAs and their economic opportunities must be analyzed separately with site-specific assumptions. This initial effort paves the way by outlining the analytical process and including some (albeit hypothetical) opportunities in the portfolio, others should be added as the WMAs are created.

To summarize, the economic opportunities retained for analysis include: a) tourism hunting, b) photo (or non-consumptive) tourism, c) beekeeping, and d) NFM. The input assumptions are briefly discussed below. For purposes of the analysis, the opportunities are staggered to avoid the inherent problems of overloading the AA as it begins operations. The continuation of the tourism hunting blocks in the WMA begins first—in year 1, followed by photo-tourism in year 2, then the beekeeping and the establishment of the collection centers in year 3, and lastly, the NFM intervention in year 4. This will allow the AA time to prepare by zoning the different land uses and establish boundary markers, enact proper by-laws, and carry out inventories, all before the field implementation begins.[13] For ease of interpretation, all of the assumptions presented in several tables in this chapter are shaded to indicate they are input assumptions. All results tables presented in **Chapter 4** are not shaded indicating calculated outputs.

[13] Staggering the activities is recommended for the sake of realism in implementation—the AAs will not have the management capacity to effectively launch all operations in year 1. The economic implication of transferring the hunting operations only from the GOT to the AA in year 1, however, will be that the GOT loses revenues while the AA gains. No other revenues to offset the GOT losses in year 1 will be generated. This, of course, raises the question of whether the GOT will be willing to relinquish revenues during the early years in exchange for higher revenues during the later years. The report addresses these questions in the context of the role of donors later in the report.

Finally, a brief elaboration of the context of the assumptions is in order. The Team had very little time to carry out a comprehensive rapid rural appraisal (RRA) in the field and met only with relatively few informants. As such, the information obtained on: a) which economic opportunities to include and/or exclude; b) the costs and benefits associated with each; c) the most obvious constraints likely to be encountered by the AAs and the WD in implementing the WPT; and d) the wide disparity of arguments between the believers and doubters, all made it very difficult to navigate between the information received and specification of assumptions. In this sense, therefore, the assumptions crafted in this section cannot reflect all of the information received—the Team's judgment had to be applied in order to derive the perceived best estimates of the variables. The strategy taken, however, was to give greater credence to the doubters than to the believers by adopting very conservative assumptions—a high discount rate, high costs and low benefits, and a strong "dampening" of projected revenues generated for all opportunities during the early years. If the results still demonstrate feasibility based on such an approach, then the economic attractiveness "comfort zone" of the opportunity is high.

3.2 Profile of Hypothetical WMA

For purposes of the analysis, the Team created a hypothetical WMA of 1,100 km^2 in size, all within the jurisdiction of one District comprising several villages. The entire area is converted to a WMA from GCA lands currently occupied by one tourism-hunting block, 700 km^2 in size and one resident hunting block of 400 km^2 in size. The area is also situated along a national park with a common border stretching for at least 50 kilometers. The topography is assumed to be fairly flat with rolling hills. A few seasonal streams cut across the area. The dominant vegetation consists of grasslands and degraded Mambo woodlands. As in all GCAs, farming is taking place around and near villages—it has expanded into the hunting blocks for several years prior to the WMA designation. Livestock grazing and wildlife have co-existed in the area for centuries and will continue in the future. Competitive land pressures are increasingly felt by the herders, however, as the herds increase and the pasture declines in quantity and quality. In short, all of the problems and issues discussed above are present, which will have to be resolved through carefully developed LUPs once the AA is in place and operating.

The area is delineated from the existing political and administrative boundaries, not ecological parameters. The latter would be a formidable, if not an impossible, task. A smooth transition from GCA to WMA can only be achieved if the current village lands (inside the ex-GCAs) are retained with minimal disturbance to the existing boundaries. The tradeoff is that migratory routes between the WMAs, the game reserves, the national parks and other protected areas will be at greater risk unless other measures are taken outside of a WMA designation to ensure that the corridors remain open. Land swaps between villages or WMAs are not politically or administratively feasible according to most informants interviewed. Obviously, it would be far preferable to delineate the WMAs along ecological parameters to ensure continuous corridor migration in perpetuity. Since corridors have already been severely compromised, however, these areas needed will not be included as part of the WMA application. Therefore, their

restoration to viability as wildlife corridors must be prioritized for attention by the GOT and the donor community and be addressed separately. WMA designation cannot be done in isolation from addressing this issue—*if the wildlife corridors cease to exist, so eventually will the WMAs.*

3.3 Structure of the AA

The choices made in the structuring of the AA and in its management of the different economic opportunities will be critical to the success of the WMAs. The challenges faced in developing effective management structures should not be underestimated. The present capacity of these remote communities for planning and for business management is, in general, extremely low. There is a legacy of failed village level enterprises and projects of all sorts—projects have failed far more often than they have succeeded. AAs will be embarking on new types of enterprises that are still in their embryonic form in Tanzania and for which there are no tried and tested models. Capacities must be built and incentives provided over a wide spectrum of needs that range from bookkeeping to business management to anti-poaching activities to communications and governance.

The EPIQ Team gave considerable thought to these challenges and strongly recommends that the approach described below be given careful consideration. Most important, the WMA should be viewed as a business with wildlife and other natural resources as its productive assets. The elected village representatives of the AA (as specified in the WMA Guidelines) should function as a board of directors of the enterprise. Meeting only periodically, however, this structure alone is not sufficient—it will not ensure the operational management of the WMA. Moreover, even if the elected officials met often, they do have the requisite management skills to ensure optimal implementation of the economic opportunities, let alone meeting and dealing effectively with sophisticated hunting and photo tourism operators. Consequently, the AA must recruit people from the outside capable of efficiently managing the WMA. These will become salaried employees as in any business. At a minimum, this would include an overall WMA manager, a financial controller, a secretary, and supervisory village game scouts. The numbers and types of other personnel will depend on the specific types of economic opportunities developed in each specific WMA. All WMAs will, according to the Guidelines, have a network of game scouts that is hierarchically organized into personnel of different levels of responsibility. The beekeeping collection and honey processing centers will have their own managers and employees, all overseen by the WMA manager. Forest management activities may have a forester or a forestry technician overseeing other employees and village forest management/woodcutter groups.[14]

[14] It is important to note that the creation of the AA structure should be an evolutionary, not a revolutionary process—the AA will not be created overnight with all of the staffing, infrastructure and equipment specified in **Table 3.1**. This is also one of the reasons why the activities are staggered—to provide enough time for the AA to grow in capacity and efficiency to accommodate different activities over time.

The most critical position will be that of the WMA manager—probably also the most difficult position to fill initially. Ideally, this person would have the following attributes: a) experience with the tourist hunting industry and, preferably, with the photo-tourism sector; b) business management skills and experience; c) basic skills and familiarity with wildlife management; and d) willingness to live and work in the WMA. Initially, the most critical short-term responsibilities will be the following:

- Negotiate lease contracts with tourist hunting companies for the current annual quota for each hunting block on the WMA. WMA revenues under the contract should reflect the actual market value of the hunting block and its quota.

- Oversee the recruitment, training and management of a network of game scouts for the WMA.

- Assess the full range of other economic opportunities of the WMAs. Draft business management plans for the WMA.

- Oversee the development of the General Management Plan for the WMA.

The financial controller will be responsible for payroll and other expenses, accounts receivable, personnel policies, inventory and bookkeeping. The AA administrative structure must also maintain close relations with the NGO community and GOT providers of technical assistance (such as the WD, TANAPA, agricultural and forest extension services, and the like).

The recruitment of competent personnel from the outside by the AA and operating the WMA as a for-profit business will not violate the intent of the WPT to devolve the management of the WMAs to the local communities, so long as the AA bylaws ensure that the local communities and the individual stakeholders in those communities remain the ultimate beneficiaries. As indicated in the analysis (**Chapter 4**), the profits are redistributed among the communities in the forms of agreed-upon development projects, and/or as dividends paid to individuals, or they could be reinvested in additional revenue-generating capital—all dependent on the decisions made by the elected community officials. The process of deciding how to allocate profits should be clearly articulated in the AA bylaws.

The assumptions pertaining to the proposed structure of the AA are summarized in **Table 3.1**. The table is divided into four parts: a) capital costs, b) the payroll, c) miscellaneous equipment, and d) operating and amortization costs. Beginning with the capital costs, the AA must be housed in offices and the key management staff must have living quarters. The assumptions indicate land acquisition and building construction costs. The alternatives would be if the AA were to rent already existing office space in the village selected for the AA, and the management staff were to rent already available housing. In these cases, the land acquisition and construction costs would not be incurred. For purposes of the analysis, the costlier land acquisition and construction alternatives are assumed.

The minimum payroll for the AA consists of one well-qualified manager paid a beginning salary of 20,000 TSh per day, or roughly equivalent to US $6,500 per year, plus annual increments and bonuses tied to performance. In addition, one accountant and financial expert and one secretary will be hired to complete the administrative staff. Other staff members on the payroll include driver/mechanics, guards, grounds-keepers, foresters, and an infrastructure (road) maintenance crew. The foresters should be on staff to be responsible for the development of the NFM activity (beginning in year 4). They should receive training in how to manage the woodlands on a rotational basis and how to protect key species and why. They will also determine the optimal biological and economic utilization of forests and forest products, as well as address the issue of improved charcoal making. The infrastructure and road maintenance crew is added to complement the road infrastructure work usually carried out by the hunting concession holders[15]. The hunting companies are in the area for only six months during which time they are supposed to maintain and fix the roads. During the off-season, however, any supplementary road work could be carried out by the AA maintenance crew[16].

The field staff also includes four supervisory game scouts who will be working with the village game scouts. A major part of the responsibilities for the AA game scouts is anti-poaching. Game guards should fill multiple functions. These could include:

- Anti-poaching patrols including the poaching of game, forest products, fish and other WMA resources.
- Problem animal control.
- Monitoring and inventory of wildlife populations for quota setting.
- Guides for hunters and tourists.
- Monitoring of WMA resource use regulations (to ensure that hunting regulations are respected, that photo tourists stay within their concession boundaries, that woodcutters respect cutting unit boundaries and cutting specifications, etc.).
- Communication and awareness raising within the WMA communities.

A minimal supply of equipment for the AA will be needed. The assumptions include furniture for at least three offices, GPS and radios, and weapons for hunting problem animals. The GPS will be used to pinpoint the location of a kill so that the recovery of the meat can begin immediately. The game scouts accompanying the hunters will send the coordinates to the AA HQ through the radios.

Finally, the operating and amortization costs indicate that the AA will make proper provision to maintain all equipment and infrastructure and eventually replace

[15] Alternatively, the AA could hire the services of the District Engineer or the Plant and Equipment Hire Company (PECHOL), or private operators to maintain roads and bridges on a regular basis. If so, the maintenance crew assumed in **Table 3.1** would not be needed.

[16] It may be possible for the hunting companies to negotiate contracts with the AAs for infrastructure and anti-poaching work during the off-season. When interviewing several hunting companies, the Team found that they, unanimously, found it difficult to live up to their lease obligations concerning road maintenance and anti-poaching during the off-season because they would not be present in the hunting blocks. If such contracts were negotiated, it would mean additional income for the AAs (not factored in here).

worn out equipment. Supplies and communication budgets are also included, as indicated.[17]

Table 3.1: Investment and Operating Costs, The AA

Capital Costs	# Units		TSh/Unit	**Equipment**	# Units		TSh/Unit
Office bldng, year	1	m2	150	Furniture	3	@	500000
Housing for staff	3	m2	60	GPS	4	@	150000
Construction/m2, TSh			100000	Radios		@	150000
Land, m2	5000	@	500	Weapons	5	@	700000
Vehicles, 4WD	2	@	20000000	Other	0	@	0
Solar panels	1	@	2800000	Other	0	@	0
Payroll	No.	Sal./day	Day/year	**Operating and Amortization Costs**			
Manager	1	20000	260	Building maintenance			2.0%
Account./fin.	1	10000	260	Furnit. maint. & replacement			10.0%
Secretary	1	7000	260	Vehicle maintenance			10.0%
Game scouts	4	6000	260	Amortization of vehicles			25.0%
Driver/mech.	2	6000	130	Other equip. maint. & amortiz.			10.0%
Guards	2	3500	260	Supplies/yr, TSh, incl. ammo			350000
Grounds keepers	2	3500	130	Communication/year, TSh			100000
Foresters, NFM	3	7000	130	Liters per vehicles/year			2500
Maint crew	4	3500	130	Cost per liter, TSh			550

3.4 General Assumptions Applied to All Enterprise Opportunities

3.4.1 Economic Assumptions

For purposes of the analysis, a relatively high discount rate of 25 percent is used, much higher than the standard 10 to 12 percent used in most development projects (see **Table 3.2**). The rate is set high on purpose in order to partially capture some of the inherent risks involved in this new and very different policy initiative—the devolvement of the management of GCAs to the local communities under the auspices of a WMA designation. It is, in this context, very important to make certain that all of the economic opportunities subjected to analysis are confirmed to be feasible based on conservative assumptions, chief among them—the discount rate. If the economic opportunities prove to be financially feasible given this high rate, then at least a portion of the risk will have been absorbed.

The analytical framework developed for the study accommodates real price and cost variations as indicated in the table. For the base case, however, these are set at zero

[17] The cost assumptions for the AA listed in **Table 3.1** are set relatively high on purpose. It is the Team's considered opinion is that the focal point of the WMA management—the AA—must be well staffed and equipped. Less staff, infrastructure, and equipment will compromise the AA's ability to manage resulting in lower revenues generated.

since neither the block fees and game fees have changed for several years[18]. Analytical scenarios could be invoked whereby prices (benefits) and costs increase or decrease in real terms over time at different rates. If, for example, real prices increase faster than real costs, the economic attractiveness of the intervention will also increase over time because the gap between benefits and costs will increase. Of course, the reverse is also a possibility that cannot be excluded.

Table 3.2 Economic Assumptions

Discount rate	25.0%
Real price variations	0.0%
Real cost variations	0.0%
Exchange rate, TSh to US$	800

3.4.2 Revenue Sharing

The base case assumptions for the sharing of all revenues between the government (Central Government and the District Councils) and the AA are provided in **Table 3.3**. For all of the economic opportunities analyzed except hunting, the assumption is that the AA will pay the regular Value-Added Tax (VAT) of 20 percent to the Central Government (on the revenues generated from tourism, beekeeping and NFM) to replace the confusing myriad of other taxes and permits currently in place. The tax structure on fuelwood, for example, is particularly burdensome. If a fuelwood producer gets paid 2,000 TSh per stacked m^3 (stere) at the harvest site, he owes the Central Government 1,000 TSh and the District Council 500 TSh, leaving him with only a net of 500 TSh per stere under the current system—a tax of some 75 percent. If he were charged only the VAT of 20 percent, his take-home pay would be substantially higher.[19] Note also that EPIQ will be funding another study addressing specific financing, taxing, and revenue sharing issues associated with the WMAs. The assumptions listed in **Table 3.3** are but a small head start on this effort. The percentages listed are calibrated to achieve the win – win objectives stated earlier—that all of the stakeholders should benefit in this endeavor. As will be clearly shown in the next chapter, these percentages indeed ensure that the **GOT gains**, the **Districts gain**, the **villages gain**, and the **wildlife is better conserved**.

The hunting game fees have a different sharing arrangement according to the assumptions. As indicated, Central Government (represented by the WD) now receives 30 percent of the game fees (before it was 100 percent), the District 10 percent, and the AA the rest (60 percent). As above, the "litmus" test is whether the GOT and the District will be better or worse off with reduced rates collected from more sources, or with all of the revenues collected from only one source—hunting—without the WMA designation.

[18] Real cost and price increases (decreases) are equal to the changes observed over time without inflation.
[19] This is based on Iringa Rural District rates. In other districts, the rates may be different. In the Pwani region, for example, the rates for a bag of charcoal are 1,000 TSh paid to the producer in the field, by the charcoal merchant. The merchant pays 300 TSh to the Central Government plus another 100 TSh to the District, plus yet another 100 TSh to the village. The consumer will eventually purchase the bag for between 2,500 and 3,000 TSh.

The modeling framework developed for purposes of the study allows for comparisons between development scenarios to determine optimal revenue-sharing blends.

Table 3.3: Revenue Sharing Formula

Opportunities	AA	GOT	District
Hunting block fees	100%	0%	0%
Conservation fee	100%	0%	0%
Game fees	60%	30%	10%
Res. hunt game fees	100%	0%	0%
Tourism	NA	20%	10%
NFM	NA	20%	10%
Collection center	NA	20%	10%

3.4.3 "Realism" Assumptions

Table 3.4 provides assumptions to infuse realism into the process. The imminent transfer of the management responsibilities of GCAs to WMAs to be run by the AAs is a momentous milestone. Nevertheless, the probability that things will go wrong is also high. The analyses carried out on the economic opportunities are essentially blueprints of the evolution of the activities over time whereby the costs and benefits are generated in accordance with the assumptions stated. In other words, if the implementers implement as called for by the assumptions, then the results are realistic and probable. If they deviate from the assumptions, however, the results will also be different. In this context, it is necessary to account for the probable fact that implementers are far from perfect.

First and foremost, it must be clearly understood and appreciated that a lot of money is at stake not previously shared with the local communities. The safari companies pay well for the privilege of conducting tourism (hunting and photo) inside the WMAs—in fact, so well that the opportunities for graft and corruption at the local community level may constitute an overwhelming temptation. Full transparency must, therefore, be built into the AA management structure to ensure that corruption is minimized. But this will take time—probably several years before the systems are well in place and functioning smoothly. For these reasons, **Table 3.4** adds realism to the process by *dampening* the benefit streams during the first few years as indicated in the table. These assumptions are not based on any documented information or statistics (because such information is rarely available anywhere). They are included only as a cautionary measure—to ensure that the results generated are based on very conservative assumptions.

As assumed, the hunting revenues will be collected in full because this opportunity is already associated with well-established formulas for block and game fees. For the photo tourism opportunity, however, the revenue streams for the 1st three years are less than 100 percent because the initiative is new—there are no formula precedents set to facilitate the establishments of photo tourism sites inside the WMAs. The same applies to the beekeeping collection centers and the NFM activity. The revenue streams

for all new activities will, in all probability, be compromised in the beginning for lack of appropriate accounting systems. Funds may be stolen or lost, funds collected may be used for personal reasons by the AA administrators, and those who are supposed to pay to the AA may do all they can to avoid paying. All of this will contribute to a far less than optimal startup of the AA management and administration of the WMAs. The fact that the percentages increase to a full 100 percent after some years, however, indicate the overall assumption that progress in the capacity and transparency of the AA administrative structure is made.

Table 3.4: Benefit Realism Factor, % of Revenues Collected

Year	Hunt	Tourism	Center	NFM
1	100%	65%	60%	50%
2	100%	75%	70%	60%
3	100%	85%	80%	70%
4	100%	100%	90%	80%
5	100%	100%	100%	90%
6	100%	100%	100%	100%
7	100%	100%	100%	100%
8	100%	100%	100%	100%
9	100%	100%	100%	100%
10	100%	100%	100%	100%

3.5 Tourism and Resident Hunting

As mentioned above, the tourism and resident hunting activity will be implemented first since it generates revenues immediately without having to make any investments to augment the productive capacity of the resources. Almost by definition, a WMA designation means that that the area has a relative abundance of wildlife since the area has been transformed in name only—from GCA to WMA, with the hunting blocks still intact. As such, the immediate revenues generated can be reinvested in the other economic opportunities of the WMA such as photo tourism development, honey-collection and processing centers, and NFM.

The assumptions pertaining to the tourism and resident hunting opportunity are summarized in **Table 3.5**. As indicated above, the WMA has one tourist hunting block 700 km^2 in size, plus one resident hunting block, 400 km^2 in size. This allocation can be the result of zoning by the AA, or it can simply be a continuation of the same hunting blocks present when the WMA was a GCA. The annual block fee of $7,500 is included as a variable since the question arises as to who should be collecting this revenue—the WD or the AA? In the analysis, it is assumed that the AA will collect and retain all of the block fees. A sharing arrangement can be instituted if there is a shortfall in the GOT revenues with WMAs vis-à-vis the revenues collected before the WMA designation.

Table 3.5: WMA Tourism and Resident Hunting

Variables	Tourism	Resident
Hunting operations start year	1	NA
Total size of WMA (km^2)	1100	NA
No. trophy hunting blocks in WMA	1	1
Avg. area per hunting block (km^2)	700	400
Annual block fees per site (US$)	$7,500	NA
Months operating per year	6	NA
No. hunters in block at same time	3	NA
% utilization of blocks during season	75%	NA
Avg. increase in annual game quota	0%	NA
Average cost per bed night (TSh)	720000	NA
% fee charged per bed night by AA	0%	NA
Conservation fee/day (TSh)	80000	NA
Average hunting success	50%	80%
Average recovery of meat	35%	NA
Dressed weight as % of live weight	50%	NA
All fees increase per year per site	1%	NA

Sources: Robin Hurt Safaris, TAWICO, Game Frontiers of Tanzania, Miombo Safaris

Other variables include the number of months per year during which tourism and resident hunting is permitted and an assumption on the number of hunters in the same block at the same time. This latter assumption is conservative in view of the fact that one of the hunting companies interviewed claimed that they could accommodate up to 10 hunters on the same block at the same time, although this would be a rare occurrence. Three hunters on a 700 km^2 block is not an unreasonable assumption.

The conservation fee of $100 per day per tourist hunter (TSh 80,000) is also assumed to be retained by the AA. The sharing of the game fees, however, is different (see also **Table 3.3** above). The assumption made is that the GOT retains 30 percent of the game fees in recognition of the fact that all wildlife belongs to the government. Sixty percent of the game fees will go to the AA as compensation for assuming the responsibility of sustainably managing the wildlife resources (which, in turn, means that the WD management burden is also reduced). The current 25-percent revenue-sharing arrangement with the District Councils is also suspended given the base case assumptions—i.e., the WD will retain the 30-percent allocation as indicated in the table, while the District Council will, instead, collect the 10-percent from the AA as indicated in **Table 3.3** above.

The base case assumptions in **Table 3.5** indicate that the average hunting success is 50 percent of the allocated quota (WD 1998/99 statistics)—the minimum success rate required is 40 percent. Compensation to the WD by the hunting companies is made for any deficiency in meeting the quota. The average resident hunting success is assumed at 80 percent since the pressure to hunt trophy animals only is not present.

One variable included in the analytical framework is a fee on the bed nights for tourist hunters. As indicated by the tourist companies, each hunter spends up to $900 per day while in the field onto which a small percentage fee could be levied, much like the practice of levying a fee on photo-tourists per bed night. For purposes of the base case, however, this variable is held at zero in view of the assumption that 100 percent of the conservation fees are kept by the AA.

It is also assumed that the AA will be much more vigilant in recovering the meat from the trophy hunters than has been the case until now. Some trophy hunters keep the meat, but the majority leaves the carcass and hides in the field after collecting the trophy. These products, particularly the meat, have value that could add to the feasibility of the AA. The purpose for the GPS and radio systems (assumed in **Table 3.1** above) is to signal to the AA HQ once a kill has been made and that the meat and hide is available for recovery. For purposes of the analysis, it is assumed that 35 percent of the meat will be recovered[20]. This is multiplied by the full live weight times the dressed weight (50 percent as assumed in the table). Finally, a one-percent real annual increase in the fees (block fees and game fees) is assumed. This is not an unrealistic assumption in view of the fact that these fees have not changed for at least 10 years.

The (hypothetical) tourism and resident hunting quota for the WMA by species is provided in **Table 3.6** (the analytical framework prepared for this study accommodates all huntable species). The quotas and values are averages per hunting block taken from WD 1998 official statistics for the nation as a whole (for the tourism hunting quotas), and for the Monduli District for the 1998 resident hunting quota (total divided by eight blocks in the District). For the meat recovery, the live weight (in **Table 3.6**) multiplied by the dressed weight (50 percent in **Table 3.5**) equals the potential volume of meat the AA can capture from the tourism hunting. In the results tables (**Chapter 4**), this will be adjusted by the hunting success and the percent recovery of meat assumptions (in **Table 3.5**).

The benefits from hunting are directly linked to the game quotas. As stated elsewhere in this report, however, the quotas are not necessarily based on the most recent biology—they may be too small or too large. For the analysis, the Team assumed quotas typical to those issued for hunting blocks in Tanzania. If these are too large, the wildlife will deplete. If they are on target, the future benefit streams will continue in the future, *and increase* over time as other habitat-enhancing activities take hold, notably the NFM intervention. The proper setting of quotas is an issue of considerable importance that should receive high priority.

[20] Hides are not included here because only zebras hides have value over and beyond cow hides. A good zebra hide can fetch up to $200. A regular cowhide fetches only up to $4 each.

Table 3.6: Tourism Hunting Quota per Block, Fees, Values

	Tourism Hunting						Resident Hunting		
Species	No.	$ Value	Game TSh Value	Live Wt. (Kg)	Dressed Wt. (Kg)	Meat Value/Kg	No.	TSh Value	Game TSh Value
Buffalo	16	$600	7680000	600	300	800	9	6000	54000
Bushbuck	4	$340	1088000	70	35	2000	2	1200	2400
Bushpig	3	$190	456000	100	50	2000	1	12000	12000
Duiker	4	$180	576000	20	10	2500	1	600	600
Eland	4	$840	2688000	500	250	2500	5	10000	50000
Hartebeast	9	$370	2664000	80	40	2000	9	3000	27000
Impala	10	$240	1920000	50	25	2000	16	2000	32000
L. Kudu	2	$1,300	2080000	125	62.5	2000	0	0	0
Dikdik	3	$170	408000	10	5	2000	3	450	1350
G. Gazelle	4	$220	704000	40	20	2000	16	1500	24000
T. Gazelle	3	$190	456000	20	10	2000	4	1200	4800
Gerenuk	3	$1,300	3120000	40	20	2000	0	0	0
Lion	24	$2,000	38400000	0	0	0	0	0	0
Oryx	2	$840	1344000	220	110	2000	0	0	0
Warthog	7	$320	1792000	60	30	2000	3	1500	4500
Wildebeest	7	$320	1792000	210	105	2000	29	2000	58000
Zebra	10	$590	4720000	220	110	2000	0	0	0
Sand Grouse	19	$10	152000	1	0.5	2000	13	150	1950
Francolin	20	$15	240000	1	0.5	2000	31	150	4650
Guinea Fowl	22	$15	264000	1	0.5	2000	31	900	27900
Geese	17	$15	204000	1	0.5	2000	13	300	3900

Source: WD

3.6 Non-Consumptive Tourism

The main economic opportunity for WMAs in the photo tourism sector in the short term seems to be in the negotiation of lease agreements with tourism companies for exclusive rights to concession areas within the WMA. A key consideration will be the compatibility of such areas with tourist hunting. Experience to date around Tarangire National Park indicates that photo safari companies may be satisfied with relatively small concessions on the order of 2000 hectares. Zoning for photo tourism concessions as a buffer between the WMA's hunting blocks and an adjoining national park may be relatively easy. The assumptions are summarized in **Table 3.7**.

As indicated, this intervention begins in year 2. It is assumed that only two sites in the 5-km wide and 50 km long buffer zone[21] between the WMA and the national park will be zoned for photo tourism (see assumptions in **Section 3.2** above) where the potential for interaction between hunters and photo tourists is at or near zero. First,

[21] The overriding assumption here is that the buffer zone around national parks and protected areas will increase from one to five kilometers.

hunters are legally prohibited from shooting inside one kilometer of a national park or protected area—this distance will increase to at least five km once the new and wider buffer zones are enacted. Second, a much wider buffer zone allows much more flexibility in establishing small gazetted areas for the photo tourists of 20 km^2 (as assumed) for walking safaris and night viewing of wildlife. Third, it should be required that photo tourists only enter and exit their small gazetted areas through the park, not through the hunting concession. **If all of these requirements are met, photo tourism and hunting can co-exist.**

The assumptions on the annual fee and bed night fees per year for photo tourism sites of an average of 20 km^2 in size reflect information gleaned from interviews conducted in the Morogoro—Jukumu Project (GTZ-supported). The revenues generated for the AA will be calculated on the bases of the fee structure assumed, the number of beds available times the average occupancy rate per year (50 percent as assumed), the number of months the facility is open for business, and the annual percentage increase in all fees in the future.

Table 3.7: WMA Non-Consumptive Tourism

Tourism operations start	2
No. sites eligible for tourism	2
Average area (km2)	20
Annual fee per site	3000000
Fee per bed night, TSh	5000
No. beds for tourists	12
Avg. occupancy rate	50.0%
Months operating per year	9
All fees increase per year per site	1%

3.7 Beekeeping

Beginning with the individual producers, the assumptions are summarized in **Table 3.8**. They are both modest and conservative. Most beekeeping in Tanzania today is of the traditional variety without the possibility of extracting the combs from the hives to determine if the honey is ready for harvesting. The honey is generally low quality and the yields are low. The assumptions in **Table 3.8** reflect one major step towards improved beekeeping—the participants will invest in improved hives, tools and protective clothing to increase both productivity and quality. It is assumed that each beekeeper will invest in and install 20 improved hives, each hive costing an estimated 26,000 TSh (Njiro Beekeeping Research Center). As indicated in the table, all maintenance, amortization, and other labor costs are accounted for, including an assumed opportunity cost of time of 700 TSh per day. This is the estimated earning power the beekeeper foregoes per day by choosing to work on the beekeeping activity (field estimate based on interviews at the village level).

Table 3.8: Individual Beekeepers

Capital & operating costs	Variables		Variables
No. of hives/indiv. operation	20	year	1
Cost/improved hive, TSh each	26000		
Hive replac., % of initial inv.	10.0%	begin year	2
Protective clothing, tools	71000	begin year	1
Amortiz. of all tools & equipm.	25.0%	begin year	2
Labor			
Person days, install hives	3	in year	1
Weeding, person days/year	8	begin year	1
Surveying, person days/year	15	begin year	1
Harvest/transport, days/year	6	begin year	1
Opp. cost of time, TSh/day	700		
Revenues	Honey	Beeswax	Propolis
Price rec'd from Center, TSh/kg	650	1400	4000
Kilos harv. per hive per year	20	1.1	0.1
No. harvests/year	1	begin year	1
Target: # prod. per coll. center	150	Yrs to target	5

Sources: Njiro Beekeeping Research Center, Mushtak Fazal, Fidahussein Co. Ltd., Dar es Salaam

The revenues are difficult to estimate because they vary widely. Three products are assumed: honey, beeswax and propolis (resin used in pharmaceuticals, beauty products and the like). Based on interviews with honey and beeswax exporters, the international markets are virtually unlimited, as is Tanzania's potential for production. The export market is, for the time being, largely undeveloped because importers cannot be assured of a reliable supply of high quality products. Exporters, consequently, are scrambling to procure enough bulk honey to fill up one container (roughly 19 tons) before they ship. Because the quality of the honey produced varies widely, the exporters sell it all as industrial honey, mixing the top quality with the poorest quality in the same container. The prices, therefore, are much lower than if enough top quality honey could be procured to fill up containers on a regular basis. The prices *to the beekeepers* assumed for honey in **Table 3.8** reflect the industrial grade. The probability is high that these prices will increase substantially once producers are fully engaged in production with improved techniques and the WMA collection centers (see **Table 3.9**) are established and operating with equipment to extract the honey, assure top product quality, all under sanitary conditions.

The collection center is part of the AA structure (**Table 3.9**). It will be strategically located in a village inside the WMAs to minimize the distance from the different production sites to the center. The main occupation of the collection center will be to procure the honey, beeswax and propolis, pay the beekeepers, and sell the products for a slightly higher price, as indicated in the table, to the exporters (or middlemen). The center will also be a convenient location for many other activities coming on stream as the AA gets established and the different economic opportunities are implemented. For example, the center will receive the fresh meat and/or biltong recovered from the hunting

activities, as discussed above. And, it may prove to be convenient places to collect and sell charcoal produced under the auspices of the NFM program (see below). The assumptions indicate that the center will be a permanent installation with infrastructure, equipment and permanent staff.

Table 3.9: Collection Centers

Capital/operating costs		Variables			Maint	Amort.
Building, m2		200	Furniture (%of initial inv.)		10%	NA
Building maintenance		2.0%	All equipment (% of initial inv.)		10.0%	15.0%
Construction cost/m2, TSh		100000	Vehicles (% of initial inv.)		10.0%	25.0%
Land acquisition, m2		500	**Labor**	No.	Sal./Day	Days/Year
Cost of land/m2		500	Skilled honey expert	1	35000	50
Well and water pump		4000000	Guards and laborers	4	3500	260
Extractor equip.	5	90000	General manager	1	20000	260
Containers/mixer, other equip.		500000	Driver/mechanic	1	6000	260
Miscellaneous furniture		400000	**Revenues**	Honey	Wax	Propolis
Solar panels		2800000	Prices per kg	750	1800	6000
Veh. (4WD pickup)	1	20000000	No. collection centers/WMA			1
L./year & TSh per liter	2500	550	Collection centers established year			3

Sources: Njiro Beekeeping Research Center, Mushtak Fazal, Fidahussein Co. Ltd., Dar es Salaam

3.8 Natural Forest Management

Development of NFM in Tanzania will probably require the assistance of donor-funded pilot projects—this is the reason for delaying the start-up by four years as indicated in the assumptions in **Table 3.10**. Selected WMAs with forest resources in need of management, situated close to major markets, would be excellent candidates to benefit from pilot NFM schemes. These should build on the wealth of experience and lessons learned, especially from West Africa, and not seek to reinvent the wheel. There will be differences between the initial trial and error stage of NFM development in a given region, the next phase of developing NFM plans for new WMAs, and the operational phase of implementing an established plan on a WMA.

It is important to note that the proposed activity is not fully consistent with the current Forest Policy (1998). This policy states that local community participation through joint forest management is to be encouraged, but largely for conservation purposes—no explicit mention is made of joint management for economic purposes, or meeting rapidly growing demands for biomass energy from the natural forests and woodlands in Tanzania. The implementation of this opportunity must be coordinated with the Forestry and Beekeeping Division and should be facilitated by appropriate policy changes.

Once natural forest management approaches have been adapted to Tanzania, and once local human resources needed for the development of management plans have been developed, it should become relatively easy for WMAs to contract the professional

services for NFM development on their lands. Few WMAs will need to employ full-time professional foresters (although these are assumed here), but they will need to engage professionals to prepare management plans, to provide training to their technicians and village forest management groups and for periodic evaluations/assessment of results.

The NFM component for a WMA should generate revenues and distribute them as follows:

- Payment to each woodcutter as a function of the quantity of wood product that he/she cuts.
- Payment into a management fund (the AA) to cover NFM costs (early controlled burning, road maintenance, professional services, enrichment plantings, etc.).
- Payment of taxes to government.

Most dryland forests managed for fuelwood or charcoal can also produce higher valued products including posts, poles, other construction materials, sawn wood products, and traditional medicines. Species such as Pterocarpus can also be harvested for furniture or parquet—a businessman near Iringa has a potential European market for Pterocarpus parquet. A partnership between such a businessman and a WMA could be mutually advantageous to both parties. Selective cuts for fuelwood can be done so as to substantially increase the production of these higher valued products.

As indicated in **Table 3.10**, the (hypothetical) WMA has three blocks of potential NFM of an average size of 10,000 hectares. The harvest rotation is 10 years; i.e., the woodcutters will return to the sites harvested every 10 years. One woodcutter is assumed to be able to cut and stack three m^3 of fuelwood per day. The woodcutters are assumed to be working full time in this occupation (260 days per year).

The key benefits associated with NFM are the assurance that the supplies of fuelwood harvested from the managed sites are sustainable, and that the condition and productivity of the resource base enhances in the process. Beginning with a degraded site, experience has shown in many countries that selective harvesting of live trees will release vigorous growth of younger stands, which will, in the end, improve the overall productivity of the forests. The objective is to return to a stand 10 years later in better condition than the stand is today. Not only will this allow for an increase in the harvest from these forests, it will also enhance the wildlife habitat and improve the productivity for the beekeepers. As assumed, the current level of productivity is 0.3 m^3 per hectare per year, indicating degraded sites (this is based on field estimates/observations compared to similar sites in West Africa). A decline of the current growth rate of five percent per year is assumed to be attributable to over cutting in the stands for lack of management.

With NFM, the situation changes. The growth rate in the cut parcels is assumed to increase to one full m^3 per hectare per year while the rest of the forest (the uncut parcels) do not lose the annual five percent since the entire forest is now under management and protected by the woodcutters (and the AA game scouts). An initial

standing volume of 25 m^3 per hectare is assumed, from which 25 percent is removed in the initial cut. The fuelwood price at the harvest site is assumed to be 1,300 TSh per m^3.

Table 3.10: NFM General Input Assumptions

NFM starts in year	4	m3 cut/staked/day, 1 woodcutter	3
Average size of management unit, hectares	10,000	No days in one work year	260
No. of management units in WMA	3	Opportunity cost of time per day	700
Years to develop each mgt. unit	10		
Without NFM			
Natural FW in-growth, m3s/ha	0.3	% decline FW in-growth/year	5.0%
With NFM			
FW in-growth, cut parcels, m3s/ha/yr	1.00	Site preparation harvest in year	1
Initial merchantable standing vol., m3s/ha	25	Incr. harv. when returning by	5.0%
Initial site preparation harvest, m3s/ha	20.0%	FW price at harvest site, TSh/m3	1,300
Permit/m3 paid by woodcutters to WMA	50		

Sources: Natural Woodlands Management Project, Iringa, Mr. Lema, Natural Resource Officer, Department of Forestry, Arusha

CHAPTER 4: ANALYSIS AND RESULTS

4.1 Introduction

This chapter presents all of the detailed results of the analysis given the assumptions discussed in the previous chapter. Two perspectives are presented—the local (AA) and government perspectives. The criteria for feasibility established by the EPIQ Team were as follows:

- That the quantitative results meet or exceed the minimum standards set (i.e, that the net present value (NPV) is positive and the internal rate of return (IRR) is greater that the returns achievable from alternative investments associated with equal risk without any subsidies);
- That the opportunities are consistent with the policy orientation of the 1998 Wildlife Policy of Tanzania (WPT);
- That the opportunities are realistically implementable; and
- That all opportunities, when implemented in the aggregate, will increase revenues for all stakeholders—the GOT, the districts, and the local communities.

The results presented in this chapter confirm that these criteria have been met.

4.2 The AA Perspective

4.2.1 Tourism and Resident Hunting

Beginning with the AA, or local perspective, the objective is to determine the financial feasibility of each economic opportunity. The first intervention to be implemented in year one is tourism and resident hunting. The revenues generated are summarized in **Table 4.1** consisting of hunting block, bed night, daily conservation, and game fees. In addition, the sale of the game meat is included with the revenue projections. All of the results presented are based on the input assumptions presented in **Tables 3.5** and **3.6** above. The game and block fees will be paid by the hunting companies to the AA instead of to the Government.

Table 4.1: Trophy and Resident Hunting Revenues for WMAs

Year	Days per Season	Tourism Hunt Block Fees	Bed Night Fees	Conserv. Fee	Game Fees	Resident Game Fees	Sale of Game Meat	Total Revenues
1	405	6060000	0	32724000	24107892	249712	3406900	66548504
2	405	6120600	0	33051240	24348971	252210	3406900	67179920
3	405	6181806	0	33381752	24592461	254732	3406900	67817651
4	405	6243624	0	33715570	24838385	257279	3406900	68461758
5	405	6306060	0	34052726	25086769	259852	3406900	69112307
6	405	6369121	0	34393253	25337637	262450	3406900	69769361
7	405	6432812	0	34737185	25591013	265075	3406900	70432985
8	405	6497140	0	35084557	25846923	267725	3406900	71103246
9	405	6562112	0	35435403	26105393	270403	3406900	71780210
10	405	6627733	0	35789757	26366446	273107	3406900	72463943

Note: The days per tourist season reflect three hunters on the same block at the same time.

Table 4.2 summarizes the benefits and costs associated with the tourism and resident hunting activities. The only costs incurred are the payments to the Central Government and the District in accordance with the assumptions stated in **Table 3.3** above. As shown in **Table 4.1**, the AA collects 100 percent of the game fees from the hunting companies, then transfers 30 percent to the Central Government, plus another 10 percent to the District Council as per the revenue-sharing assumptions, as indicated in **Table 4.2**. Other costs associated with the hunting activities, such as the anti-poaching and other activities of the game scouts, the recovery of meat from the kills, are all absorbed by the AA costs (see **Section 4.2.4** below). The intervention is feasible as indicated by the positive NPV[22]. This result, of course, is expected since the AA does not have to make any direct investments in the resources—the wildlife and its habitat—in order to increase its productivity.

Table 4.2: Benefits/Costs, Tourism Hunting

Year	Central Govt.	District Council	Total Cost	Total Revenues	NCF to WMA
1	12053946	4017982	16071928	66548504	50476576
2	12174485	4058162	16232647	67179920	50947273
3	12296230	4098743	16394974	67817651	51422677
4	12419193	4139731	16558923	68461758	51902835
5	12543385	4181128	16724513	69112307	52387794
6	12668818	4222939	16891758	69769361	52877603
7	12795507	4265169	17060675	70432985	53372310
8	12923462	4307821	17231282	71103246	53871964
9	13052696	4350899	17403595	71780210	54376615
10	13183223	4394408	17577631	72463943	54886312
NPV					185026185
IRR					NA

[22] The IRR cannot be computed because there are no negative cash flows to offset the positive ones.

4.2.2 Non-Consumptive Tourism

The photo tourism activity will come on line beginning the second year as indicated by the assumptions in **Table 3.7** above. The results, all linked to the assumptions in this table, are presented in **Table 4.3**. The revenues are derived from two sources—the block fees and the bed night fees. Both add up to substantially more than the taxes paid to the Central Government and the District, as indicated in the table. As indicated, the NPV is strongly positive, also (as above) because the AA does not need to make any investments in the productive capacity of the resource base for photo tourism. This is the responsibility of the tourism concession holder.

Table 4.3: Non-Consumptive Tourism Revenues and Costs for WMAs

Year	Tourism Days Per Season	Tourism Block Fees	Bed Night Fees	Total Revenues	Central Govt.	District Council	Total Cost	NCF to WMA
1	0	0	0	0	0	0	0	0
2	3240	3978390	10741653	14720043	2944009	1472004	4416013	10304030
3	3240	4636355	12518157	17154512	3430902	1715451	5146353	12008158
4	3240	5307080	14329117	19636198	3927240	1963620	5890859	13745338
5	3240	6306060	17026363	23332423	4666485	2333242	6999727	16332696
6	3240	6369121	17196626	23565747	4713149	2356575	7069724	16496023
7	3240	6432812	17368593	23801405	4760281	2380140	7140421	16660983
8	3240	6497140	17542279	24039419	4807884	2403942	7211826	16827593
9	3240	6562112	17717701	24279813	4855963	2427981	7283944	16995869
10	3240	6627733	17894878	24522611	4904522	2452261	7356783	17165828
NPV								38490655
IRR								NA

4.2.3 Bee-Keeping and Collection Centers

Table 4.4 shows the costs and benefits for a single beekeeper, given the conservative assumptions specified in **Tables 3.8** and **3.9** above. As indicated, the results are strongly positive. The IRR is nearly 66 percent, or more than twice the assumed opportunity cost of capital. The probability for obtaining this result, however, depends to a large extent, on the success of the collection center. If it did not exist to provide the services needed to ensure a high quality product, and a ready nearby market outlet for the beekeepers, then the activity simply continues as before—low quality products, no marketing organization, no cohesion among the beekeepers.

The center is key to the whole beekeeping process. Although a part of the AA structure, it should be considered a separable activity, which has to be profitable in its own right. It should not subsidize unprofitable activities, even if they are *perceived* to benefit the local communities. By definition, unprofitable activities will always detract from, never add to, the cumulative economic well being of local communities. It is for this reason that only the strongly feasible activities are retained for analysis and candidacy for AA support.

The costs and benefit results associated with the collection centers are summarized in **Tables 4.6** and **4.7**. As indicated for the individual producers, the results strongly suggest that the intervention should be part of the AA structure. Moreover, this is only the beginning. The center could easily expand into many other activities to be added as the opportunities arise, including becoming a brisk market place for products such as the honey, beeswax and propolis (as assumed here), plus charcoal, meat, biltong, fuelwood, fish, and other commodities in the future as new opportunities are added. If all of the new activities are financially feasible in their own right, then the center where the products are transacted can only increase in value, over and beyond the results shown here in **Tables 4.6** and **4.7**.

Table 4.4: Costs and Benefits for a Single Producer

Year	Hives	Hive Maint. & Replac.	Equip. & Replacem.	Labor	Total Cost	Honey Sold (L)	Wax Sold (Kg)	Resin Sold (Kg)	Total Revenues	Net Cash Flow
1	520000	0	71000	22400	613400	260000	30800	8000	298800	-314600
2	0	52000	17750	20300	90050	260000	30800	8000	298800	208750
3	0	52000	17750	20300	90050	260000	30800	8000	298800	208750
4	0	52000	17750	20300	90050	260000	30800	8000	298800	208750
5	0	52000	17750	20300	90050	260000	30800	8000	298800	208750
6	0	52000	17750	20300	90050	260000	30800	8000	298800	208750
7	0	52000	17750	20300	90050	260000	30800	8000	298800	208750
8	0	52000	17750	20300	90050	260000	30800	8000	298800	208750
9	0	52000	17750	20300	90050	260000	30800	8000	298800	208750
10	0	52000	17750	20300	90050	260000	30800	8000	298800	208750
NPV					740204				1066866	326663
IRR										65.6%

Table 4.5: Costs and Benefits, Collection Centers

Year	Land Acquisition	Bldg. for Honey Extr. & Maint.	Procure and Maintain Vehicles	Amortize Vehicles	Procure, Maint. @ Replace Furn.	Procure & Maintain all Equipment	Amortization of All Equipment	Payroll	Total Cost
1	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0
3	250000	400000	23375000	500000	440000	3750000	562500	10590000	39867500
4	0	400000	3375000	500000	40000	375000	562500	10590000	15842500
5	0	400000	3375000	500000	40000	375000	562500	10590000	15842500
6	0	400000	3375000	500000	40000	375000	562500	10590000	15842500
7	0	400000	3375000	500000	40000	375000	562500	10590000	15842500
8	0	400000	3375000	500000	40000	375000	562500	10590000	15842500
9	0	400000	3375000	500000	40000	375000	562500	10590000	15842500
10	0	400000	3375000	500000	40000	375000	562500	10590000	15842500
PV									46053298

Table 4.6: Aggregate Volumes Collected at and Sold From Center

Year	No. Producers	Honey Kilos	Wax Kilos	Propolis Kilos	Honey	Wax	Propolis	Aggregate Benefits	Aggregate Costs	Net Cash Flow
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0
3	30	7200	396	36	3240000	427680	129600	3797280	39867500	-36070220
4	60	16800	924	84	8820000	1164240	352800	10337040	15842500	-5505460
5	90	28800	1584	144	17280000	2280960	691200	20252160	15842500	4409660
6	120	43200	2376	216	29160000	3849120	1166400	34175520	15842500	18333020
7	150	60000	3300	300	45000000	5940000	1800000	52740000	15842500	36897500
8	150	60000	3300	300	45000000	5940000	1800000	52740000	15842500	36897500
9	150	60000	3300	300	45000000	5940000	1800000	52740000	15842500	36897500
10	150	60000	3300	300	45000000	5940000	1800000	52740000	15842500	36897500
NPV								54423635	46053298	8370337
IRR										35%

4.2.4 Natural Forest Management

The NFM results are presented in **Tables 4.7 – 4.9**. Beginning with the biological results, recall from the discussion above that the objective of NFM is to increase the productivity of the forest resources while harvesting sustainable supplies of fuelwood and charcoal from the available management units. Given the assumptions in **Table 3.10** above, this objective is satisfied in **Table 4.7**. Without a WMA designation, the initial standing volume of 25 m^3 per hectare will decline to 17.9 m^3 per hectare by year 10 due to the lack of a management plan (over cutting and high grading of the forest are the inevitable results). With management, however, the selective removal of the 6.3 m^3 per hectare in the active management block in year 1 will release a more productive and managed stand for vigorous growth which will increase the volume over time, as indicated in the table. At the end of 10 years, the stand will have fully recovered to its original level plus have added a small incremental volume (from 25 to 26.3 m^3 per hectare). The addition to the total could be higher or lower—it all depends on the volume of the initial cut and the rotation period applied. In this case, the volume per hectare would have increased substantially above the original volume if the rotation period were 15 instead of 10 years. The last two columns show the total volumes harvested in each management unit and in the aggregate (for all three active management units) in years 1 and 10, respectively.

Tables 4.8 and **4.9** show the cost and benefit results associated with individual management units and in the aggregate (all three active units), respectively. As indicated, the first three years are zero because the intervention starts in year 4. The costs in each table consist of two elements—the opportunity cost of time (the incomes foregone by working as a woodcutter), and the fees paid to the WMAs. The latter—50 TSh per m^3 comprises the only income the AA receives from the operation. This money will be used to pay for the AA foresters designated to lead the activity.

Table 4.7: With and Without WMA, Production/Hectare/Year

	W/out WMA	With WMA			
Year	Vol./Ha & Loss/Year	FW Prod. m3 per Ha	Volume Harv//Ha	Vol. Harv./ Mgt. Unit	Vol., All Mgt. Units
1	25.0	25.0	5.0	5000	15000
2	24.0	20.7	0.0	0	0
3	23.1	21.4	0.0	0	0
4	22.2	22.1	0.0	0	0
5	21.4	22.8	0.0	0	0
6	20.6	23.5	0.0	0	0
7	19.9	24.2	0.0	0	0
8	19.2	24.9	0.0	0	0
9	18.5	25.6	0.0	0	0
10	17.9	26.3	5.3	5250	15750

Table 4.8: Costs and Benefits per Individual Management Unit

Year	Vol. Harv./ Mgt. Unit	Val. of FW to Woodcutters	Opp. Cost of Time	Payment To WMA	Total Costs	Net Cash Flow/Ha
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	0	0	0	0	0	0
4	5000	3250000	3500000	250000	3750000	-500000
5	5000	3900000	3500000	250000	3750000	150000
6	5000	4550000	3500000	250000	3750000	800000
7	5000	5200000	3500000	250000	3750000	1450000
8	5000	5850000	3500000	250000	3750000	2100000
9	5000	6500000	3500000	250000	3750000	2750000
10	5000	6500000	3500000	250000	3750000	2750000
NPV						1374854
IRR						NA

Table 4.9: Costs and Benefits, All Management Units

Year	m3 Harv./ Mgt. Unit	Val. of FW to Woodcutters	Opp. Cost of Time	Payment To WMA	Total Costs	Net Cash Flow/Ha
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	0	0	0	0	0	0
4	15000	9750000	10500000	750000	11250000	-1500000
5	15000	11700000	10500000	750000	11250000	450000
6	15000	13650000	10500000	750000	11250000	2400000
7	15000	15600000	10500000	750000	11250000	4350000
8	15000	17550000	10500000	750000	11250000	6300000
9	15000	19500000	10500000	750000	11250000	8250000
10	15000	19500000	10500000	750000	11250000	8250000
NPV						4124561
IRR						NA

4.2.5 AA Management of WMA

The aggregate results for the AA management of the entire WMA are presented in **Tables 4.10** (costs) and **4.11** (benefits and costs combined). The columns in **Table 4.10** show the land acquisition costs, infrastructure investments, and all operating costs, including the regional collection centers, adding up to a grand total in the last column. The returns from the different economic opportunities (collection centers, hunting and tourism, and NFM) are replicated in **Table 4.11** from several tables: a) **Table 4.6** for the collection centers, b) **Table 4.1** for tourism and resident hunting, c) **Table 4.3** for photo tourism, and d) **Table 4.9** for the NFM activity. Included on the cost side are the aggregate amounts paid by the AA in taxes to the Central Government and Districts in accordance with the stated revenue-sharing assumptions, plus the aggregate WMA costs.

The final result indicates that, despite the conservative assumptions used, the effort is financially feasible given the positive NPV and IRR of 32.7 percent. The results indicate that the AA will be able to meet all financial obligations plus make a reasonable profit that can be reinvested in new activities to benefit the local communities. The most interesting finding, however, is that the excess of benefits over costs could be used to finance development projects in the individual villages, such as agricultural input warehouses and grain banks, build maternity wards, pharmacies, schools, and the like, or simply be distributed as cash dividends to the villagers. Except for where the net cash flows are negative, the last column in **Table 4.11** measures the excess of benefits over costs in US $ terms. As shown, more than $67,000 per year could be allocated—over and beyond the current budgetary allocations from the Districts during the later years.

Finally, the tourism hunting activity appears to be the most lucrative of all of the interventions analyzed by far, given the assumptions (as indicated by the percentage allocation of benefits at the bottom of **Table 4.11**). This, of course, can only be speculative because the analysis is only based on a hypothetical WMA and, as such, the

game quotas for tourist and resident hunting are not known, nor are the sites eligible for photo tourism known. These have only been assumed. If the assumptions were different, then the relative weight of each activity could switch as well.

Table 4.10: Summary of Aggregate WMA Investments

Year	Land Acquis.	Office Building & Maint.	Housing for Staff & Maint.	Proc., Main-tain, Operate Vehicles	Amortiz. of Vehicles	Procure, Maint. @ Repl. Furn.	Proc., Maint. Amortize Equipment	Supplies and Communic.	Payroll	All Costs Collection Center	Total Cost
1	2500000	15000000	18000000	41375000	10343750	1500000	7650000	450000	19380260	0	116199010
2	0	300000	360000	5375000	10343750	150000	765000	450000	19380260	0	37124010
3	0	300000	360000	5375000	10343750	150000	765000	450000	19380260	39867500	76991510
4	0	300000	360000	5375000	10343750	150000	765000	450000	19380260	15842500	52966510
5	0	300000	360000	5375000	10343750	150000	765000	450000	22110260	15842500	55696510
6	0	300000	360000	5375000	10343750	150000	765000	450000	22110260	15842500	55696510
7	0	300000	360000	5375000	10343750	150000	765000	450000	22110260	15842500	55696510
8	0	300000	360000	5375000	10343750	150000	765000	450000	22110260	15842500	55696510
9	0	300000	360000	5375000	10343750	150000	765000	450000	22110260	15842500	55696510
10	0	300000	360000	5375000	10343750	150000	765000	450000	22110260	15842500	55696510
PV										46053298	245165003

Table 4.11: Summary of Benefits and Costs

	Benefits					Costs				
Year	Collection Centers	Tourism Hunting	Non-Cons. Tourism	NFM	Total Benefits	Central Government	District Council	WMA Costs	Net Cash Flow	Available for Community Projects
1	0	66548504	0	0	66548504	12053946	4017982	132270938	-65722434	$0
2	0	67179920	14720043	0	81899963	15118494	5530166	57772670	24127293	$30,159
3	3797280	67817651	17154512	0	88769442	16486589	6193923	99672021	-10902579	$0
4	10337040	68461758	19636198	750000	99184996	18563840	7212055	78742405	20442591	$25,553
5	20252160	69112307	23332423	750000	113446890	21410301	8614586	85721398	27725492	$34,657
6	34175520	69769361	23565747	750000	128260628	24367072	10072066	90135648	38124980	$47,656
7	52740000	70432985	23801405	750000	147724390	28253788	11994309	95944607	51779783	$64,725
8	52740000	71103246	24039419	750000	148632665	28429345	12060762	96186618	52446047	$65,558
9	52740000	71780210	24279813	750000	149550023	28606659	12127880	96431049	53118974	$66,399
10	52740000	72463943	24522611	750000	150476554	28785745	12195669	96677924	53798630	$67,248
NPV									17298096	
IRR									32.6%	
%	23.8%	59.1%	16.6%	0.4%	100.0%					

*Note: The cost indicated in the column labeled "WMA Costs" in this table are different from the total costs for the WMA shown in **Table 4.10**. This is because the disbursements to the Central and District government have been added to the investment costs in **Table 4.11**.

4.3 Sensitivity Analysis of Results

The sensitivity analysis is presented in **Table 4.12** for all of the economic opportunities individually (hunting, photo tourism, beekeeping, collection center, and NFM), and in the aggregate (AA). The analytical approach is simple—the question asked is how sensitive the NPV results are with respect to changes in the input assumptions. The objective is to identify switching values for the interventions (hunting and photo tourism excluded, as explained below), or where the NPV switches from positive to negative as the assumptions (benefits, costs or other variables as indicated) are changed in increments of plus or minus 10 percent relative to the base case. The switching values identify the most sensitive variables indicated by the shaded cells in **Table 4.12**. The base case results reflect the assumptions specified in **Chapter 3** are presented in the middle column.

The hunting and photo tourism opportunities are associated with positive NPVs over the full range for all of the variables tested. These results will always be positive, however, because costs are not considered—no investments are needed *by the AA* in order to generate the revenues—the resources are already intact, they do not need to be created. Any investments needed in infrastructure and personnel to realize benefits from hunters and photo tourists must be incurred by the hunting and/or photo tourism companies themselves, not by the AA (from whose perspective the analysis is carried out).

The sensitivity of the assumptions on the NPV results for the AA, however, is different. The AA must be created and staffed in accordance with the draft guidelines to manage the WMA. The sensitivity of *all* benefits accrued to and all costs incurred by the AA are shown in the bottom rows of the table. These results are indeed sensitive as indicated—less than a 10-percent reduction in benefits, and less than a 10-percent increase in costs can be tolerated before the NPVs switch from positive to negative (see the shaded cells in the table). These results were more or less expected, however. The base case assumptions specified are very conservative, the interventions are staggered (**Section 3.4.3**) so that the revenues generated during the early years are derived from fewer sources, and a considerable benefits "dampening" factor assumption is assumed (**Section 3.1**) to reflect probable AA startup difficulties. If these assumptions were canceled (or reduced), the base case NPV would nearly double and any changes in the input assumptions would generate far less sensitive results.

From the perspective of the individual beekeepers, the opportunity is very solid—the intervention can tolerate more than a 30-percent reduction in benefits, and/or a 30-percent increase in costs, with no switching values. On the benefit side, this means that even a 30-percent reduction in prices for honey, beeswax, and propolis will still generate feasible results—the beekeepers would still be better off with the beekeeping activity than without it, given the assumptions. Likewise, a 30-percent increase in costs will not cause the NPVs to switch from positive to negative.

The feasibility of the collection center exhibits some sensitivity to changes in the input assumptions as indicated in the table. The benefits and costs can be allowed to decrease and increase, respectively, by more than 10 percent before the NPVs switch to negative. Since the collection center is part of the AA structure, however, it would be subject to the same caveats just discussed—conservative assumptions, staggering of the interventions, and the benefits "dampening" assumption.

Finally, the NFM activity results from the woodcutters' perspective is somewhat sensitive to changes in the input assumptions—a maximum reduction of between 10 and 20 percent in benefits can be tolerated before the NPV switches to negative. On the cost side, more than a 30-percent increase can be tolerated.

Table 4.12: Sensitivity Analysis

	-30%	-20%	-10%	**Base Case NPV**	10%	20%	30%
Hunting							
Benefits	131676612	149459803	167242994	185026185	202809376	220592568	238375759
Util. of block/season	148972841	160990623	173008404	185026185	197043967	209061748	221079529
Avg. hunting success	176172641	179123823	182075004	185026185	187977367	190928548	193879729
Discount rate	238038584	217821869	200300550	185026185	171636370	159836403	149385205
Photo tourism							
Benefits	26943458	30792524	34641589	38490655	42339720	46188786	50037851
Avg. occupancy rate	30064322	32873100	35681877	38490655	41299433	44108210	46916988
Discount rate	53060098	47451328	42640242	38490655	34892831	31757811	29013057
Beekeeping							
Benefits	6603	113289	219976	326663	433349	540036	646722
Costs	548724	474703	400683	326663	252642	178622	104601
Discount rate	509654	439054	378631	326663	281756	242782	208816
Collection center							
Benefits	-7956754	-2514390	2927973	8370337	13812700	19255064	24697427
Costs	22186326	17580997	12975667	8370337	3765007	-840323	-5445653
Discount rate	21898317	16371569	11935360	8370337	5503906	3199618	1349105
NFM							
Benefits	-2575256	-341984	1891288	4124561	6357833	8591105	10824377
Costs	9587009	7766193	5945377	4124561	2303744	482928	-1337888
Discount rate	7043817	5871731	4912708	4124561	3474126	2935198	2486960
AA							
Benefits	-83926778	-50104228	-16281678	17540871	51363421	85185971	119008520
Costs	149911550	105787991	61664431	17540871	-26582688	-70706248	-114829808
Discount rate	47116939	35390294	25654355	17540871	10756407	5065843	279782

4.4 GOT Perspective

The results from this hypothetical WMA show that all stakeholders gain substantially with WMA designation, as indicated in **Tables 4.13** and **4.15** below. It has been clearly shown that, given the assumptions, devolving management authority and responsibility to the local communities represented by a competent AA administrative and managerial structure will **not** be a "zero-sum" game—the local gains will **not** be at the expense of GOT and/or District losses. The simple fact of the matter is that size of the "pie" will increase substantially to compensate for any perceived losses associated with the old revenue-sharing formulas, plus add considerably to the ability to finance real projects at the local level under local control. In addition, the WMA designation will better conserve wildlife because the AAs will provide resources (from the revenues generated) to manage the WMAs which neither the WD, the Tourism Division, nor TANAPA have been able to do. Their budgets are not directly linked to the revenues generated, and precious little is provided for game scouts (who are poorly paid and far too few to ensure proper coverage of the game controlled areas).

4.4.1 Jobs

As shown in **Table 4.13**, the WMAs will generate a substantial amount of employment as a result of implementing the economic opportunities. The grand total column indicates that an estimated 141 person-years of employment will be generated in year 1, increasing to 201 years equivalent of jobs per year beginning in year 7 in the local communities. In addition to the purely monetary returns, this impact is perhaps even more important. The AA and the collection centers will create permanent paid full and part time employment for several people, the NFM activity will employ crews of wood cutters, and the beekeeping activity will provide employment for some 150 beekeepers (given the target assumption) on a part time basis. These impacts quickly add up and contribute substantially to the socio-economic well being of the local communities.

Not directly counted are the economic impacts on the local and regional communities generated as a result of this substantial increase in local employment. Certainly, the previously unemployed, now employed, participants will enjoy higher standards of living. In addition, however, their expenditures in the local communities will generate multiplier impacts far beyond their own direct impacts. As these people spend money on consumables in the local communities and in the region, the overall incomes will also increase as more merchants service additional customers. The size of the multiplier effect may be substantial—its estimation is beyond the scope of this study, however.

Table 4.13: No. of Jobs Created as a Result of WMA Designation

	Beekeeping			NFM			Collection Centers			WMA HQ (AA)			Grand Total
Year	# Jobs	Days/Yr	Years Eq.	# Jobs	Days/Yr	Years Eq.	# Jobs	Days/Yr	Years Eq.	# Jobs	Days/Yr	Years Eq.	Years Eq.
1	0	0	0	0	0	0	0	0	0	20	36570	141	141
2	0	0	0	0	0	0	0	0	0	20	36570	141	141
3	30	960	4	0	0	0	7	5810	22	20	36570	141	167
4	60	1920	7	19	5000	19	7	5810	22	20	36570	141	190
5	90	2880	11	19	5000	19	7	5810	22	20	36570	141	193
6	120	3840	15	19	5000	19	7	5810	22	20	36570	141	197
7	150	4800	18	19	5000	19	7	5810	22	20	36570	141	201
8	150	4800	18	19	5000	19	7	5810	22	20	36570	141	201
9	150	4800	18	19	5000	19	7	5810	22	20	36570	141	201
10	150	4800	18	19	5000	19	7	5810	22	20	36570	141	201
Total	900	28800	111	135	35000	135	56	46480	179	200	365700	1407	1831

4.4.2 Government Revenues Generated Without and With WMAs

Finally, **Table 4.15** compares the aggregate revenues from the hunting activity only accrued to the Central and District Governments with and without WMAs. The data used for the comparisons is drawn from WD statistics as shown in **Table 4.14**. Only the revenues invoked in this analysis—those subject to a different revenue-sharing formula—are considered here. These include the hunting block fees, the game fees, and the daily conservation fees to the WD, and 25-percent distribution of the game fees to the Districts. All other revenues associated with licenses for gun imports and trophy exports remain as before—they are not included in the discussion here.

The game fee revenues collected by the WD from the GCAs in 1997 amounted to some $2.3 million. Twenty-five percent of that amount now goes directly to the Districts. The annual block fees are retained by the GOT, as are the conservation fees of $100 per day. The $30 per km^2 estimate in **Table 4.14** is based on an assumed number of hunters on the block and the number of days per year the block is occupied per season (taken from **Table 3.5**) divided by the number of km^2 per block—1,442 km^2 as indicated in the table. All of these fees are now redistributed in accordance with the base case revenue sharing assumptions in **Table 3.3**.

The results are presented in **Table 4.15**. Without the WMA designation, the GOT stands to collect a total of $30 per km^2 from these fees after adjusting for the 25-percent contribution to the Districts. This amount remains constant over time if the fees are not increased. Likewise, the Districts will collect an average of $10 per km^2 (the 25-percent allocation from the WD), also remaining constant over time. With a WMA designation, however, the revenues to the GOT and the District begin at a lower level and stay lower for four to five years when a breakeven point is reached. Beyond year five, the GOT and District revenues with WMAs climb rapidly beyond the revenues collected without a WMA designation and remain higher. The gap between the with and without WMA designation can only widen as new economic opportunities are added. The key question

(and major problem) is the first four years when the GOT and District will experience lower revenues than usual. Herein lies the opportunity for the donor community to step in to bridge the gap by working with the AAs in the local communities to start activities earlier (i.e., eliminate the "staggering" factor), and ensure that all of the revenues are collected instead of having to invoke the "benefit realism" factor in **Table 3.4**.

Table 4.14: Hunting Block Revenues

GOT rev. from game fees, 1997	$2,328,960
Paid to District Councils	25%
Annual block fees	$7,500
Area in resident blocks	20%
Conservation fees per km2	$30
Total area in GCAs (km2)	58565
Total area in Game Res. (km2)	117374
Average size per block, km2	1442

Table 4.15: Revenues Generated With and Without WMAs

	Revenues Generated			
	Central Government		District Council	
	W/out WMA	With WMA	W/out WMA	With WMA
Year	$/Km2	$/Km2	$/Km2	$/Km2
1	$40	$22	$10	$7
2	$40	$27	$10	$10
3	$40	$29	$10	$11
4	$40	$33	$10	$13
5	$40	$38	$10	$15
6	$40	$43	$10	$18
7	$40	$50	$10	$21
8	$40	$50	$10	$22
9	$40	$51	$10	$22
10	$40	$51	$10	$22

CHAPTER 5: COMMENTS ON THE DRAFT WMA GUIDELINES

5.1 Introduction

This short chapter is an addition to the SOW. The Team was asked to comment on the current version of the Draft Guidelines with respect to their adequacy to facilitate the implementation of the economic opportunities. The overall conclusion is that the draft WMA Guidelines represent a very important step towards empowering local communities to capitalize on the economic opportunities discussed in this report.

5.2 Lessons Learned From Other Countries

Based on CBC approaches of many different kinds across all renewable natural resource sectors in many different countries, the Team suggests that the following basic conditions for successful CBNRM must be in place:

- The economic incentives for local communities must be clear and they must be substantial.

- The empowerment of local communities to control access and use of their natural resources must be real. Government must be willing to "let go" in more than just a symbolic sense. Communities need to be assured that they can continue to manage and exploit their resources as long as they conserve and sustain them.

- The procedures for transferring management rights from government to communities must be as clear and simple and straightforward as possible. The highly detailed nature of the guidelines should be revisited.

- The requirements placed on villagers must be realistic. It should not be expected that local communities will be able to undertake sophisticated land use planning exercises or accomplish tasks that government itself has rarely accomplished with the resources available at its disposal. The land use plan requirement for the villages in the Guidelines should be revisited.

- The role of government must evolve towards that of guarantor and protector of the community's rights, toward a role of delivery of services needed by the community management structures and towards a role of monitor to ensure that the community strives to manage their resources sustainably.

The basic requirements that communities should fulfill in order to qualify for WMA management rights as an AA include the following:

- The community should be free to define itself. Associations should be voluntary.

- The CBO applying for AA status should clearly define the limits of the WMA that they wish to manage. In cases of doubt over the boundaries between CBO land

and that of their neighbors, the AA should be required to negotiate agreed upon boundaries with their neighbors before they apply for AA status.

- The CBO should develop an institutional structure for the AA representing the local communities.

- The CBO should develop a plan, to be approved by their General Assembly, for equitable sharing of future benefits.

- The CBO should commit itself to the principle of sustained yield management (i.e., ensuring adequate regeneration and sustained productivity of all biological resources harvested).

5.3 Procedures for Creating WMA

The Procedures for creating WMAs should have the following characteristics:

- They should be clear, simple, straightforward, and easily understood by village leaders. The current draft version of the guidelines is far too detailed and complex.

- Communities should be given objective information on both the potential advantages and disadvantages of creating a WMA, including information on all economic opportunities. There needs to be a recognition in the Guidelines that the more money the AA earns from a wide variety of complementary activities, the greater will be the tax base and the more money the GOT and Districts will be able to collect.

- The procedures should lead to the creation of WMAs that are viable economic entities that can cover costs and operate at a profit. Tax levies and revenue-sharing too skewed towards the GOT and the Districts must not place these principles in jeopardy.

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ANNEX 1: SCOPE-OF-WORK

ECONOMIC OPPORTUNITIES IN WMAs

1. EPIQ/TANZANIA TASK ORDER

EPIQ/Tanzania is a buy-in from USAID/Tanzania into EPIQ (Environmental Policy and Institutional Strengthening Indefinite Quantity Contract), a USAID/Washington Global Bureau sponsored mechanism. International Resources Group (IRG) is the lead contractor in the EPIQ consortium. EPIQ/T supports achievement of USAID/Tanzania's Strategic Objective in E/NRM (Strategic Objective # 2, or "SO2"). EPIQ/T strives to achieve its objective through assisting the government of Tanzania (GOT) to develop an enabling environment for community-based natural resource management (CBNRM). Its main partner in this process is the Ministry of Natural Resources and Tourism, and its Wildlife Division (WD). EPIQ/Tanzania maintains an office in Dar es Salaam with full time staff, complemented by Tanzanian and expatriate consultants.

2. ACTIVITY BACKGROUND

Implementation of the Wildlife Policy of Tanzania (WPT) and the creation of Wildlife Management Areas (WMAs) will open the door for a number of enterprise opportunities for the local communities that now benefit little from the presence of wildlife in their areas. Although it is *expected* that WMAs will benefit the local communities in different ways, little is actually known about which kinds of opportunities exist, or the costs and benefits of these opportunities. Clearly, the legislative texts and by-laws that will provide detailed guidance on how to manage the WMAs, including the rights, responsibilities, and revenue-sharing formulas will greatly help define what the opportunities are and their parameters. Rigorous analyses of their costs and benefits and feasibility from the perspective of the communities, however, still remain to be done. At least two opportunities (those most often cited) are singled out for analysis in this SOW: *hunting* and *tourism*.

- **Hunting**: It is almost taken for granted that a WMA designation will allow local communities a much greater share of hunting revenues than they receive at present. It remains to be documented, however, whether the increased revenues will be sufficient to offset the costs (or investments) the communities will have to incur if they are to take advantage of this opportunity. In this context, it will be of the utmost importance to know as precisely as possible: a) the probable magnitudes of the revenues associated with the enterprise opportunities, and b) how anticipated revenues will be shared by the different stakeholders (i.e., the communities, the districts, and the GOT). This information will be an essential input into the preparation of the legislative texts, guidelines, and by-laws covering the revenue-sharing agreements between the different stakeholders.

- **Tourism**: Likewise, it is widely believed that a WMA designation will provide a much better platform for the local communities to become increasingly involved with tourism. If the potential for additional tourism in Tanzania is high, as assumed by most, then both communities and the private entrepreneurs stand to benefit considerably. Kenya's tourism sector, for example, generates much higher revenues than does Tanzania because the infrastructure to accommodate tourists is better, as are the services provided. If Tanzania catered more to tourists by offering infrastructure and services of equal quality to those offered in Kenya--more tourists would presumably come and revenues would increase. The existence of WMAs would provide momentum to the idea that local communities could take better advantage of tourism opportunities, including the development of optimal blends of ecologically based and cultural tourism attractions. Again, however, the benefits and costs of any such tourism configuration in WMAs are not well documented. The results of the analysis proposed here will, as above, become inputs into the preparation of the legislative texts, guidelines, and by-laws concerning not only the revenue-sharing arrangements, but also limitations imposed by the tourism carrying capacity of the WMAs. Unhindered tourism development in the WMAs will ultimately affect wildlife migration patterns outside the parks and protected areas and disturb wildlife behavior--the kinds of results that conservation-based initiatives are intended to prevent or avoid.

To the extent feasible, the team will analyze the cost and benefits of other potential environmental activities which may be of interest to the local communities aiming to establish WMAs. The purpose of this SOW is to provide the analytical foundation for determining why or why not WMA designation should be actively sought by the local communities. In short, the EPIQ consultants will be charged with the tasks of: a) identifying and describing the kinds of enterprise opportunities emerging as a result of a WMA designation, and b) analyzing their associated costs and benefits.The consultants will carry out rigorous analyses of hunting and tourism as described above, and of other opportunities which have emerged from CBC experiences in the region. Other opportunities may include trade in live birds, sale of value-added products from wildlife production and marketing of non-timber products, game ranching, and game meat sales and other CBC activities of potential interest to local communities.

3. THE ASSIGNMENT/LOE

The first order of priority will be to identify a realistic range of wildlife-related enterprise opportunities for local communities emerging as a result of a WMA designation in selected target areas to be identified (the opportunities will differ between areas). As discussed above, two such opportunities are hunting and tourism. Others, such as value added products from wildlife (hides and skins), and game meat, will also be identified and analyzed. The consultants will identify such opportunities from a careful review of the literature, and more importantly, through rapid rural appraisals in the target areas with the local communities. The report prepared by the consultants will include at least the following six elements (or sections) as briefly summarized below:

3.1 Statement of the Problems and Key Issues

Building on the literature review and the rapid rural assessments, the consultants will provide a detailed overview of the key problems and issues, and a summary of the methodology and principal data sources used in carrying out the study. Problems and issues should be articulated from two perspectives: a) the interests of the GOT (the conservation of wildlife and the preservation of biodiversity--largely a biological orientation), and b) the interest of the local communities (greater revenues generated – largely an economic orientation). The ultimate task for the consultants is to identify "win-win" opportunities with respect to the orientations and to define optimal blend(s) or ways to balance the two perspectives in both economic and biological terms.

3.2. Resource and Socio-Economic Assessments

The data needed for the analysis will be collected through a process of rigorously reviewing the literature and carrying out rapid rural appraisals in the study areas (to be determined). The main purposes for the latter are to: a) develop resource and socio-economic profiles of the target areas, including dominant land uses and trends and demographics of the communities, and b) identify potential hunting, tourism, and other enterprise sites and opportunities in the areas. This will include descriptions of the potential tourism attractions and why they should be considered potential attractions, the trophy and commercial hunting potential in the areas (including a list of available species for hunting), physical accessibility of the areas, and proximity to national parks and other protected areas. The purpose for these assessments is to provide the essential information and data for carrying out analyses of different land uses to determine: a) whether (and where) non-consumptive (or sustainable) wildlife is a competitive land use option, or b) to describe the conditions needed to ensure wildlife's competitiveness with other land uses (such as agriculture, domestic livestock, and/or mining, forestry conservation). Such conditions might include investment incentives. If so, a range of such incentives will be analyzed in a benefit-cost framework with particular reference to attractiveness to the investor, the magnitude and distribution of benefits and costs imposed (including both direct monetary costs (e.g. foregone tax revenues) and the opportunity costs of alternative competing land uses which may be rendered infeasible by virtue of the incentives offered for investment in a wildlife enterprise.

3.3 Breakdown of the Revenues

Having identified and described (3.1 and 3.2) the enterprise and CBC opportunities, the consultants will then carry out the necessary analyses to obtain a comprehensive overview of the full range of costs and benefits involved. The main focus of the consultants will be to determine the probable magnitudes of potential revenue that the enterprises could possibly generate given different investment options, ranging from low to medium to high, and the associated costs. The consultants will include a focus on the marketability of the products or services associated with enterprise opportunities

(estimate what the markets would bear) and the associated financial and other risks, making suggestions regarding how such risks might be mitigated and what guidelines or procedures might be needed to guaranty the security of investments. The total anticipated revenues generated from CBC activities in the WMAs must also be broken down into components to estimate the minimum fraction needed to justify the investments. This breakdown is essential in order to estimate how much will be spent on the sites themselves (typically only a small fraction of the total) which comprises the upper limit of the pool of money available for recurrent cost funding (i.e. to ensure the sustainable integrity of the enterprise). If the formula for revenue-sharing does not satisfy this minimum requirement (i.e. if the percentages allocated to the GOT and/or districts are too high relative to the portion retained by the local entrepreneurs and/or the local communities), then the CBC opportunities are effectively nullified (and the WMA becomes a meaningless concept as far as the local communities are concerned).

3.4 Carrying Capacity

Both hunting and tourism are subject to carrying capacities that must be estimated. Unconstrained hunting will soon deplete the wildlife in the area. Likewise, unhindered tourism may affect wildlife behavior and/or the cultural integrity of the local communities. The consultants will focus on these constraints by estimating the levels of acceptable use (carrying capacities) for hunting (in terms of the behavioral patterns of the wildlife, the species to be hunted and the quotas per hunting party), tourism (in terms of the maximum number to tourists to be allowed in a given area at a given time), and other economic opportunities related to CBC activities, as appropriate.

3.5 Required Investments

The consultants will use the carrying capacity estimates to calibrate the investments needed in hunting and tourism infrastructure (and in the other enterprise opportunities identified). Also estimated will be the recurrent costs associated with the capital investments; i.e., the operating and maintenance costs.

3.6 Contribution to Sustainable Community Development

The consultants will carry out a rigorous analysis of the projected costs (capital investments and recurrent costs) and benefits of the enterprise opportunities to determine their feasibility from the perspectives of all stakeholders, including the GOT, the districts, the entrepreneurs themselves, and the local communities. To do so, different revenue-sharing scenarios must be integrated into the analysis in order to derive the optimal formula that will ensure a win/win situation for all. There must be economic incentives for all partners in the development schemes. To ensure the sustainability of the management and operation of the WMAs, therefore, the consultants will seek to define the optimal balance between the improved economic well being of the communities and the participating entrepreneurs, and the government's objective of wildlife conservation. In this context, sustainable community development is the essential prerequisite for

success with the latter. Wildlife will only be conserved if the communities find it in their best economic interest to do so.

4. LEVEL-OF-EFFORT (LOE) AND DELIVERABLES

4.1 Detail LOE:

CONSULTANT	TASK	DAYS
Kjell Christophersen (Natural Resource Economist) (Expatriate)	- Team Leader – responsible for the study and for the timely completion and quality of deliverables - Focus on identifying all relevant economic variables, comparative analysis of several land use options ad carry out the analysis. - Jointly to address issues mentioned in section 3 and subsequent subsections hereunder	30
Roy Hogan (Expatriate) Community-based Natural Resources management and conservation specialist)	- To focus on the need to properly take into account the sustainability of resource utilization in the benefit/cost calculus, and bring to bear broad international experience in community-based approaches to resource management in assessing options - Jointly to address issues mentioned in section 3 and subsequent subsections hereunder	20
Dr. George Jambiya (Local expert) Resource assessment, resource economics and land use specialist	- To focus on the assessment of resources and their utilization and assessment of alternative uses in the environmental economics view point. - To carry out analysis of options bearing in mind - broad experiences and knowledge of CBC/CBNRM issues in Tanzania and the region - Jointly to address issues mentioned in section 3 and subsequent subsections hereunder	25

The Team Leader will be responsible for the conduct of the study and for the timely completion and the quality of the deliverables.

4.2 Deliverables

- Initial draft report submitted to EPIQ/T and Wildlife Division – 3 copies to each institution plus a diskette with the report and any annexes in Word format
- Final report prepared/submitted to EPIQ/T and Wildlife Division (5 copies each, plus a diskette with report and any annexes in Word format) within 5 working days following receipt of comments on the draft report from both institutions
- Work with WD to prepare a presentation of report findings to key stakeholders and policy makers in a meeting to be scheduled later by WD.

4.3 Commencement: This assignment is to be carried out within the time specified starting from the first week of April 2000. Each consultant will start to do literature search, undertake preliminary analysis of the literature, identify information gaps and potential stakeholders to be consulted. The team will meet in Dar es Salaam on/about 20 April 2000 ready to start the fieldwork.

5. RELATIONSHIP TO EPIQ/T MISSION

This assignment is crucial from the perspective of contributing to the process operationalizing the Wildlife Policy of Tanzania. The WD has developed draft guidelines for establishment of WMAs. WMAs will enable local communities be more responsible for the management of natural resources and also accrue benefits from the different economic and social development options that will be identified in this study. The completion of this work will enable WD achieve its objective of identifying and assessing the social and economic options that are available in the WMAs for communities to benefit. It will also help USAID /T achieve its E/NRM Strategic Objective #2 in supporting the GOT in the management of natural resources.

6. EPIQ OVERSIGHT:

The consultants will report to and work very closely with the EPIQ Project Technical Manager.

ANNEX 2: INSTITUTIONS AND INDIVIDUALS MET

African Wildlife Foundation (AWF)

Ami, Philip, Game Officer, Mto Wa Mbu Game Post
Dinho, Aloyce, Senior Enterprise Officer
Kauzeni, Pellage F., Community Wildlife Management Officer, Morogoro
Ngido, Eutropia, Manager Community Conservation Centre

GTZ

Baldus, Rolf

Ministry of Natural Resources and Tourism, Wildlife Division

Maige, Matthew, Assistant Director
Masekeba, Ildefons A., Tourism Officer
Malango, A. S., DNRO, Iringa
Mdoe, Charles J., Assistant Director, Wildlife Development
Severre, Emmanuel L., Director of Wildlife
Zacharia, Miriam

Natural Woodlands Management Project (NWMP), Iringa, Tanzania

Gideon, Anyimike M., District Catchment Forest Officer
Lerdorf, Henrik, Technical Advisor, NWMP

Njiro Beekeeping Research Center

Lesio, Nicephor, Technical Adviser
Bakari, Samuel, Assistant Director

MBOMIPA

Bikurakule, Dorothy, Community Development Officer
Mutabiilwa, James M., Community Conservation Officer, TANAPA Rep.
Walsh, Martin, Technical Advisor

Tanzania National Parks (TANAPA)

Melamari, Lota, Director General
Bigurube, Gerald, Director of Parks Management & Conservation

UNDP/GEF - Cross Border Biodiversity Project

Rodgers, Allen, Project Coordinator
Salehe, J. Y, Project Manager

Tanzania Wildlife Conservation Monitoring

Mduma, Simon, Director
Mbanika, Job, Technical Officer
Unayu, John, Technical Officer

World Wildlife Fund (WWF)

Siegel, Paul, Country Representative, WWF.TPO

Hunting and Tourism Safari Companies

Mohamed, Aboukadir L., Game Frontiers of Tanzania
Abdallah, Moshin, Chairman, Game Frontiers of Tanzania
Blumer, Jay, General Manager/Director, Robin Hurt Safaris
Coles, Scott, Director/Guide, Miombo Safaris
Gullam, Sahmurad D., General Manager, TAWICO
Mantheakis, Michael D., Dir. Miombo Safaris Ltd.
Oliver, Paul, Managing Director, Oliver's Camp Limited
Orio, Eliab G., Hunting Manager, TAWICO

Others

Chamsa, Alban, Village Exec. Officer, Village of Mahuninga
Flikaos, George J., hunter and tobacco farmer, Iringa
Fox, Peter, professional hunter and tour operator, Iringa
Flikaos, Michael, hunter and tobacco farmer, Iringa
Jones, Clive, Independent Consultant
Kikotii, Jailosi, Ward Exec. Officer, Village of Mahuninga
Lema, Mr., Natural Resource Officer, Department of Forestry, Arusha
Mushi, Jackson, owner of Twiga Campsite and Lodge, Mto Wa Mbu
Mushtak Fazal, Fidahussein Co. Ltd., Dar es Salaam

ANNEX 3: UNEDITED FIELD NOTES

Prepared by George Jambyia

Date: 2/05/2000

Meeting with Dr. Martin Walsh. - Chief Technical Adviser (CTA) - MBOMIPA Iringa (and supporting staff)

Introduction of MBOMIPA by Mr. Walsh:
MBOMIPA is not only about wildlife—it implements many other activities. It has been perceived by some that the project investments have not justified the returns—the economic value of MBOMIPA is being questioned. They recommend taking a hard look at MBOMIPA investments with a view to spending the money elsewhere if the MBOMIPA investments prove to be marginal or worse. Martin does not share this view.

Description of Wildlife Opportunities within MBOMIPA operational areas:

- Idodi and Pawaga Divisions are also GCA's and have hunting blocks.
    - Northern Area -allocated to tourist hunting - run from WD in DSM.
    - Southern - there is a quota for local resident hunting. This area was originally allocated to tourist hunting, but did not succeed. Now it is allocated to resident hunting.
    -
    - The MBOMIPA area has 5 hunting blocks - 4 for villages and 1 for the District.

	OLD RNP	**OLD LMGCA**	**OLD (ACI)**	**NEW LMGCA**
TOTAL SURVEYED AREA	2475 KM^2	3775 KM^2	6250 KM^2	2075 KM^2
# OF TRANSECTS	42	54	58	43

LMGCA - Lunda - Mkwambi Game Controlled Area.
RNP - Ruaha National Park.

- Tourist hunting blocks contain animal species considered best/trophies for tourist hunting. Resident hunting - mainly non-trophy hunting and smaller species.
    - The procedure is that resident hunters go to the District Game Officer (DGO); shows possession of a General License and then buys a permit (hunting license). The money is paid to the DGO, who then redistributes it to the District Councils. Resident hunters can only hunt in GCAs that may have trophy animals and low human populations

- One important concern about tourist hunting and WMAs is that resident hunters may be squeezed out. The income generating potential from tourist hunting is greater than from resident hunting, therefore, resident hunters will lose.

- In addition to paying the high block fees, tourist hunting companies are also responsible for the development and maintenance of the infrastructure (roads, water, etc.) and some contract with villagers to look after the hunting areas during the off season.

- For resident hunters, the game fees are much lower than for the tourist hunters. A buffalo permit, for example, fetches only TSh 6,000.

- When MBOMPIA process began in 1995/96 (prior to '95 the DGO was hunting for the villagers or villagers hunted by themselves). At that time a typical buffalo raised about 40,000/= to 45,000/= from sales (meat, hides, etc.).

- 1995/96 the villagers auctioned their animals. In that 1st year hunters paid the 6,000/= and raised between 40,000/= to 100,000/= per buffalo. Money accrued to the villages.

- Tanzanian groups offered to local hunters what was referred to as semi-tourist hunting. This concept took hold and Tanzanian sport hunters now pay between 250,000-300,000/= and $ 375 for buffalo. The meat is given to the workers and/or to the villagers.

- The resident hunting quotas are rarely filled because the hunters are not interested in some species.

Additional observations/comments

- Under good management and with reasonable considerations in place the danger for resident hunting disappearing could be gradually phased out.

- The human population in the project area is approximately 30,000 in 16 villages.

- The villagers within the MBOMIPA areas are eagerly waiting for the Guidelines to form the WMAs/AAs.

- The pilot projects have contributed to the overall understanding of the current policies of devolving management and authority over the GCAs to the local communities.

- There is an obvious need for multi-village institutional structure to ensure management prior to the creation of the AAs. In the MBOMIPA area, they have developed village and district level frameworks, but nothing links the two or between villages.

- CONFLICTS emerging between consumptive and non-consumptive uses - find it difficult for the two to mix.

- In terms of external interests, 2 groups (direct approaches for photographic safaris) have approached MBOMIPA from SA and another from Zimbabwe. This is the first group.

- The second group- Europeans based in Tanzania and Kenya and the primary interest is to get into the Park using local areas - adjacent - to get into the Park cheaply. If they can coexist - how can they co-exist, can a modality be found for them to coexist? One thing is clear, there is a demand for the development of photographic safaris - (non-consumptive)

- TANAPA is experimenting with walking safaris in Ruaha National Park. It is also trying to identify areas suitable for tented camps etc. outside the park, at the fringes, basically on village land. Same idea from different angles.

- There is a very good potential for walking safaris - someone even tried to introduce hang-gliding, balloon safaris!

- Even some of the local hunters are looking at looking/interested in developing some local tourist investments.

- What would be the ideal AA? The ideal will be a body that met regularly and that would be able to plan and work in conjunction with WD and District Councils. It must work openly to reduce the possibility of corruption taking place and/or be affected by external influence. Not only would it need to have the capacity to operate and manage the WMA efficiently also have the capacities to do this work.

- One suggestion is that the AA could hire a full time competent manager for the group.

- Reported that Marshall Murphree - suggested that we split the area into 2 WMAs - and have somebody be there in the field to provide the management/entrepreneurial skills/inputs. Marshall Murphree's advice is to let it happen, let plan go on and allow them to make mistakes etc. etc. SOME WILL SURVIVE, SOME WILL FLOUNDER AND SUCCEED LATER, AND SOME WILL FAIL.

- THE ROLE OF THE REGULATORS - checks and balances - **cannot leave it all to the District** - the more institutions there are to oversee and collaborate - the better.

- Are there any other economic opportunities to hunting and eco-tourism?

    - The vegetation has great value. If you were to harvest all the trees in the natural forest, the short run income would be high. Must be done in a sustainable fashion.

- Tourist products and fuelwood for tobacco farms. Strong demand for fuelwood for tobacco - Fuelwood for tobacco curing. Great potential for NFM.

THREATS/POSSIBILITIES

These include:

- Low District Capacity - Different Agendas - Lack of interest - could have made Community Based Forest Management actually work - but has not happened.

- Let the MEMA Project (- Kiswahili Abbr. for Matumizi Endelevu Ya Misitu Ya Asili (Sustainable Management and Utilization of Natural Forest Areas) take the lead in these areas.

- Lack of **will** from the District - very difficult - as a result takes a lot of work and time to do this - to make things happen on the ground (low interest at District levels)

- E.g. the Duru-Haitemba forest in Arusha - Babati district -communities are protecting it - but not yet into sustainable harvesting.

- **Beekeeping** - they have commissioned a survey to establish a baseline before embarking on this potential.

- Possible contradiction of giving the villagers/given the villages a high level of sensitive responsibilities **but without the capacity to manage the resources** - land; forest, other natural resources, etc.

- They are at a disadvantage when they have to work with investors - there is a need/role for brokers - must have an 'honest broker' around

- Going to devolve power and authority to a group of people but first they have to be empowered and have/build capacity to be able to take on the added responsibilities.

- To make that happen, it will be necessary/prudent to have very confident and competent management (capacity) in place.

INTERVIEW/DISCUSSION WITH HENRIK OF MEMA/UMFP (DANIDA-funded woodland management project). Project is less than 1 year old.

The highland forests

- Evergreen Moist - High Altitude.

The Lowland forests

- Drier Miombo - Woodlands forest - National Woodlands Management Project.

- Natural Forest Management with WMAs - under community management.

- 1st priority, getting baseline info to start the project in the target area. So far, have done the aerial photography of the whole district. Will eventually define management entry points and then sit down with villagers and make critical management decisions.

- In Udzungwa's (mountain forest) doing biodiversity - biological baseline surveys.

- Will carry out game survey in the woodlands together with MBOMIPA; to be carried out by the villagers themselves.

- 1st thing is to define the area - in the villages the area is more loosely defined and so Land-Use Plans (LUPs) and zonation has to take place.

Potential for management

- **Markets exist:** Local markets for fuelwood/charcoal in urban areas and for tobacco production/processing/curing.

- No game controlled area (GCAs) but plenty of hunting - local hunting - near the Mtera Dam.

- Not really necessary to do full aerial coverage of the forest - can do a simple inventory with villagers, with appropriate training. Do a preliminary species list - look at vegetation, signs of gains/losses - other activities - a participatory approach.

The woodland products

- Commercial fuelwood harvesting - targeted at tobacco farmers. Tobacco farmers say the NF areas are too few—they plant their own eucalyptus trees.

- Could develop into charcoal production

- Fuelwood Reserve - Kitalimiwa Forest Reserve. For Iringa - will come further away and put the project area within a 40-120 km. range of Iringa town.

- Initial discussions with villagers came up with potential for timber; fuelwood for local consumption - and in areas close to Mtera Dam -fuelwood for fish drying.

OTHER ISSUES

- Old Forest Act - had/have to get permission to cut. These rules have been ignored. For certain tree species - one has to get a permit. Expressed the need for certain species - they do not exist; they have been over-harvested. Large diversity - a list of

150 woody species - from inventory, at least > 100+ tree species and also trying to trace the variety of species.

- What would they, the villagers, want to manage for? Are they thinking economically or ecologically? **In the dryland forest area - they are thinking in ecological terms - whereas in the dry woodland forests, they are thinking in economic terms - incomes, basic needs, etc.**

- Ethnic groups/clashes - Pastoral migration groups are/have come into this area - transhumance and nomadic groups that have come into the area and are often in conflict with sedentary groups over resources, land water, forests etc.

- Standing biomass between 20-60 m^3 standing/ha. This is a manageable volume ($^1/_2$ m^3/ yr. regeneration/growth /ha/year with no management).

- Precipitation ≈ 500 to 700 mm per year rainfall.

- Will most of these species coppice? Most Miombo species have very strong coppicing potential.

- Mushrooms, edible herbs, indigenous fruit, medicines. These are currently not being marketed.

- In Iringa, huge potential for honey production but the market is very poorly organized - Out of town it is used for beer production - could be an export market for honey - esp. when focus on production potential.

- If you get the right quality - but for export. If you have a good quality honey it is a high value product.

3/5/2000, AT TUNGAMALENGA village.

In Iringa district, just outside the Ruaha National Park. a local investment has recently been realized, managed by **Southern Highlands Tourism Development Co. Ltd,** 6 cabins, 3 big and 6 small tents. Visit during rainy season, no guests at facility.

- Some eco-tourism, non-consumptive/ provision of services etc. Charge $ 10 per head per bednight. (locals 5000/= per head), $ 3 per tent per night. Food ~ 500/= per plate - local food.

- Camp started in 1997 - with curio shop - actual camp started in January 2000.

- All handicrafts is imported from outside Iringa region (inside Tanzania) e.g. Mtwara, Njombe, Arusha etc. During the high/peak season the place is full.

- No guides or vehicles.

Interview with Bwana Zechariah - Chairman Village Natural Resources Committee (VNRC) - 1995-97 (under REMP) was the Village Wildlife Committee

- MBOMIPA involvement from 1997

- The VNRC consists of 7 members, representatives from different resource user groups, the Chairperson, Deputy and Treasurer - 1 or 2 of these have to be women.

- VNRC is also a Technical Advisory Committee to Village Government. Responsibilities include: a) To liaise with District, RNP; Ward and Division NRM officers, b) Identify various opportunities that relate to eco-tourism.

- Local natural resources and sources of revenues include: gravel, stones/thatch grass, fuelwood/charcoal, and wildlife. Charge of 1,000/= for Stone/Gravel 3-4 tons, thatch about 10 tons. = 1000/=. Fuelwood, stacked per m^3 = 500/= the same stack fetches between 4000/= to 5000/= in town. Charcoal per bag 250/= - local consumption (then the same 28-32 kg. bag sells for between 800/= to 1000/= in town.

- Fuelwood from the IDODI AND MALINZANGA areas

3/5/2000, ALBAN CHAMSA - Village Executive Officer (Mtendaji wa Kijiji), MAHUNINGA VILLAGE, IRINGA RURAL DISTRICT.

- Majengo - Community wide/shared benefits from wildlife – attributable to project - schools/social services established as priorities. Also, activities have led to increased local (additional) employment e.g. village patrols. All of this has led to higher degree of participation.

- For a secondary school would have meant that each HH would have had to make a contribution - using part of the incomes to pay the artisans - also use part of the funds to pay the village patrol.

- Tangible benefits have reduced over time.

- Village has NR Account, NRM committee proposed expenses.

3/5/2000, HAT - Hunting Association. Discussions and interviews with: George John Fliakos, Michael Fliakos, and Peter Fox - Iringa. Discussions focused on resident hunting.

- Resident hunting group: Iringa Wildlife Conservation Association (34 members) and Ruaha Conservation Association (some tourist hunting)

- *Peter Fox*, with his brother has a tourism hunting company, also based in Iringa. Resident hunters cannot compete with professional hunters

- Other opportunities that exist within their operational areas include: Timber, hardwood, honey etc., lot of timber poaching in/and around area - lack of proper management - they point out that the prospects for improved management are there.

Professional Hunters

- Trophy hunting focus: Safari Conventional Internal (SCI)- Records - the biggest and the best SCI-rated husks for elephant hunting.

- Pointed out the over-hunting and elimination of the giant tuskers is affecting and changing the genetics of the game - what remains is the scrawny breed of elephants.

- The second largest recorded tusks happened in Ruaha. - tusk measurements are going down. - **Genetic Degeneration Phenomenon taking place.**

- In contrast to professional hunting, Resident hunters getting into both meat and trophy hunting e.g. Warthog, Impala, Eland, Buffalo, Dik Dik (Dykers).

- Now # of hunters drops but with fees of $ 180-200 compared to $ 8. Other fees include tourist hunting fees, $ 700 Game License, trophy fees, and export fees.

- In 1999 - 25% of District Fees (Professional) amount to between 4 - 1/2 million to 13 million (Shillings).

- **NOTE: villagers receive more benefits from resident hunters than they do from the professional hunters**.

- In MKUPULI - WILAYA BLOCK - main reason to take it over was to look after it - to allow wildlife populations to build up. Hunters note wildlife number have dropped and are concerned about the future of their sport and are thus keen to participate in better management of the resource base.

- Some **aspects of the quota distribution**. E.g. at the Nzombi River (each hunting company is allocated about 3 leopards and 3 lions - way in excess of what is worth shooting) each block gets exactly the same (blanket) quota - **NOT BIOLOGY BASED.** - This is very problematic. - In Rungwa Game Reserve - used to do walking safari - the lions are getting scarcer now.

- Noted that **tourist hunting blocks tend to have larger quotas these days** - in contrast to old days residents used to get higher quotas - Income based/driven?

- Lots of illegal things are happening e.g. professional hunters are under so much pressure to perform, that they bait for Leopards or Lions. Legally, this kind of hunting can only be done during daylight hours, many do it at night, however. Before, hunters had to pass an exam. Question: are you allowed to bait? Today, many would say yes (wrong answer!). Nothing appears to be done about this—loss of control.

Under these circumstances, Village Game Scouts who are accompanying the hunters will be under considerable pressure to turn a blind eye. Their incomes are low and they will tend to welcome any additions.

- **The interviewees think that WMAs/AAs, will improve the situation, but a lot more needs to be done to get on top of the current situation in terms of capacity building, etc. Sound good on paper, but reality set is quickly.**

- Villages within MBOMIPA engage up to 15 people as village game scouts during anti-poaching operations - more capacity. These are youngsters – they work largely as volunteers (small remuneration—5,000 Tsh/month).

- Under WMA, tourism hunting would be preferred – they pay more.

- Potential for photographic tourism in the project area – limited. Visibility is low and bush is very thick. In less densely vegetated areas, game is more abundant. Last 15 years—no elephants observed, now they are moving in - especially since last year 1999/2000.

- **Hunting and photographic tourism cannot complete, except for rare circumstances.** There will always be a possibility that accidents will occur.

Procedure for felling trees (for tobacco curing) village areas:

- The large scale tobacco farmers need a lot of fuel wood—they get this from nearby villages - about 40 kms away. The procedure is as follows:

  - Send application to the VNRC

  - Villages have to approve first, then they contact the regional and districts for approval

  - The Regional/District Natural Resources Officers (RNRO/DNRO) issue a license.

  - The law says they can only use 30% indigenous trees for curing (70% has to be planted trees) - often eucalyptus species.

  - When cutting in the village forests, the villages don't charge anything - except pay for labour.

  - Other fees are: Government 1000/= per M^2. And Region/District, 500/= per M^3.

- They have suggested that: The villagers could pay all the tax etc. - and large farmers would pay the market price with Tshs. 2000/= M^2 and do all the collection.

- Other FW sources:

    - Can get mature eucalyptus from Mafinga - selling at 1000/= per M^3 but transport costs with 7000/=/M^3. Same with MEMA sources trees; transport cost are too high.

    - In Nyangoro - again transport costs are too high.

    - Charcoal collection so far is done - just before Idodi - just after Miwira/after Nyamahana: just before - range of ≈ 80 kms.

- There is plenty of raiding/poaching of trees - esp. indigenous hard woods. (leaf dealers)

- There are about 40,000 tobacco farmers in Tanzania. Main international buyers include Richmond Virginia and Reynolds Tobacco.

- Est. need 30,000 tons of dry wood p.a.? for Tanzania tobacco growers.

- In terms of village forest management and enterprise, they argue, let somebody do the transport and **villagers only manage, supply and sell fuelwood plus value added.**

- Lowest yield of Tobacco - with only 700 kgs/ha. The average in Africa with 1500 kgs/ha. Flakios harvests 2,400 kgs of tobacco per ha.

- They say that if the villages are/will be getting good money from WMAs - the money should be reinvested in efforts to improve agricultural incomes too.

FOR FOREST BASED INCOMES

- Hard woods, Mninga, Mikola {Mkola} want it for PARQUET flooring, has buyer interested in buying 2000 tons/year.

- Thatch—naturally occurring thatch and export to Greece - what is locally known as Makolo Grass. Harvested and sold in sheets (sown sheets per M^2) $ 1:50 per M^2 (FOB) ≈ US 0:40 paid to villagers.

- Honey**:** Managed to get 80 Lts. of honey from 1 hive. Largely because of the dual flowering - they have twice year harvesting. (Honey poachers – problem because they often start bush fires—now they are much more careful with fire, however.

Regional Charcoal Estimates - Supplies to Iringa Town/Municipality

- 40 - 60,000 bags @ Forest Royalty 400/= fetches about 12-16 million Tshs. 1 month. = 144,000,000.

- Fuelwood for tobacco only = 20,000M^3 each M^3 1500/=.

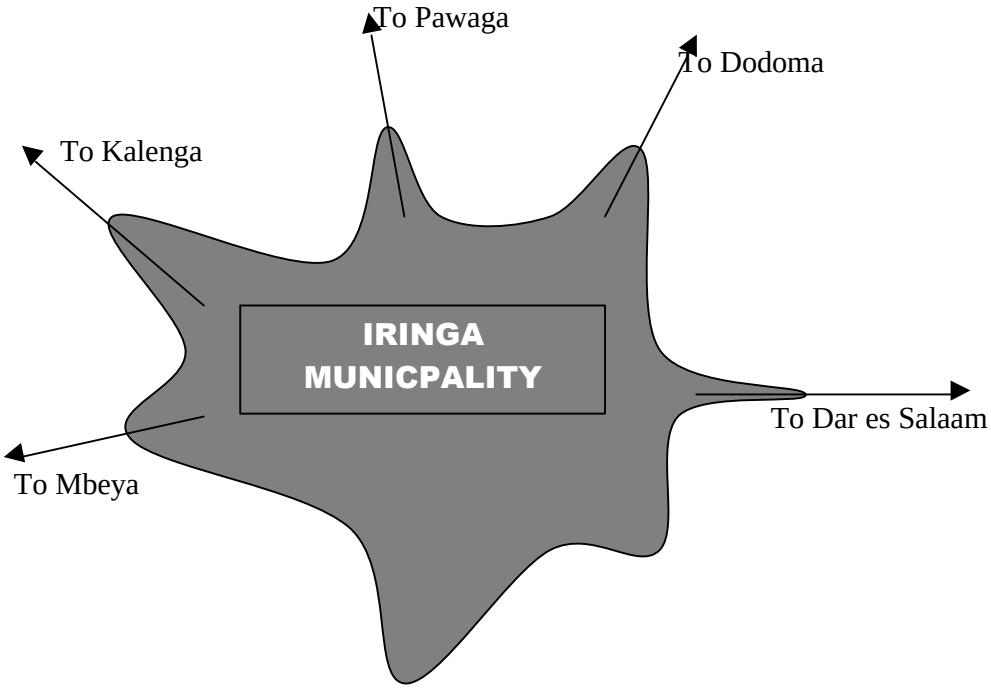
- Timber, 1000 M^3 each 25,000/= , or 25,000,000

- Others 1,000,000. All of this: total Annual Revenue Collection Est. 200,000,000 Tshs. Actual collected - Fluctuating max. 15,000,000 (1997)
  8,900,000 (1998)
  2.3 million (1999).

- Why fluctuating:
  - New councilors.
  - Regional authority dealing on tobacco curving.
  - Lack of transport for patrol.
  - Poor Staff motivation
  - (un) Willingness of people to pay levy - very high.
  - Poor system of revenue collection - leakage.
  - Enhance control - proved to be very difficult.
  - Corruption of government staff.

Supply time/duration.
- 21.00 hrs
- Direct to customers
- This is a daily activity (supply).
- Sometimes the illegal suppliers are armed (with muzzle loaders)

The Five Main Entrances to the Iringa distribution Web



Basically Iringa is a big market for fuelwood and charcoal. Iringa Municipality has 23,000 households, with approximately 120,000 inhabitants in core urban area. The district has 650,000 people, including the Municipality. There are also many governmental institutions, schools, colleges, commercial institutions and so on. In Iringa district, there is a significant dependency on fuelwood energy.

Interview with Miombo Safaris Ltd. - Dar es Salaam
With Michael D. Mantheakis (Director/Professional Hunter)

There is a clash between photographic safaris (2 or 3) from different companies - this causes conflicting management; conflicting dates of operations; rigid controls are essential to avoid clashes, etc.

VIP Safari (who operate in Korongo and Grumeti) are looking into the possibility of doing both, i.e. shooting/hunting safaris and photographic safaris in one area in order to maximize the revenue-generating potential from the resources.

RE: Local Safaris to be more competitive and not lose their niche, will need some changes so as to be able to compete with the larger international safaris.

Also operating costs are very high - on top of the high fees being paid to government. e.g.

- Anti poaching operations within the allocated hunting blocks cost ≈ 3 million shillings per month (≈ 3,750.00 per month) for next 6 "no-activity" months - Miombo would like to fill in this gap by perhaps selling adventure tourism, e.g. rock climbing, walking safaris, and other non-consumptive uses.

- Wet/muddy - season - wet season plus diversity of Tanzania terrain. Miombo safaris - have and can do both and thus do a wider range of activities. It helps, but those that do not have this capacity are without revenues until the wet season is over.

- 6 months hunting season - very unrealistic and forced to pack too much in a short while and quotas are rarely used up. Nine months is much better to have a presence that can also act as a deterrent against poaching.

- Regarding hunting quotas of high value animals, we are allocated 3 lions and we are just doing 1 lion/year. - this is largely through a self-improved moratorium, to allow the animals to multiply and grow.

- Some interesting facts regarding hunting Vs non-consumptive tourism - **The smaller (R^3) block in schools 35 km x 12 kms is making more money than the whole of Mikumi NP.**

- **The 40% utilization rule can be detrimental, because if it is in a depleted area - it is bad news.** Sometime it is necessary to hunt less than the quota (which apparently is not based on good biology/status.) to allow certain species to regenerate.

- **The 40% limit can be counterproductive especially in a case where hunters are already or have already broken even and are making a profit.** This is upsetting especially if the hunting Co. is nursing an area (for stock regeneration) then it becomes

detrimental if they are obliged to reach the 40% lower limit as they have to shoot animals that do not need to be shot. **This is bad economics/biology.**

- They noted that with some good care, **hunting areas can bounce back very quickly. So the ecological and economic management issues are important.**

- Also noted that commercial bush-meat poaching is very detrimental and is happening **- there is a market for bush-meat, illegal as it is, so there should be a market for legal bush-meat too.**

- Tenancy and tenure should not be too short, they propose 5 years, based on the investments they need to make in the hunting operations, and in developing the hunting areas. This gives them more security and reasons to want to invest ore. It is a very important factor that must be considered. Too short a period—loses interest in long term investment and sustainability - **they do not want to kill the goose that lays the golden egg.** Sustainability is critical.

Reflecting on the attitude towards safari hunter: We are making money at same time -- officials need to change attitudes and facilitate wildlife enterprise.

- It is important that there is transparency in the establishment of WMAs and AAs.

- Miombo operating in Game Reserves - e.g. Rungwe. And have the following points/suggestions:

  - Villagers are not qualified to select an operator, high probability for bribery etc., WD must be involved with selection of hunting co's.
  - Under some of the existing situations, the issue of negotiations will also be open to abuse. Great care has to be exercised.
  - Seen this is Maasailand, where an external party can "buy" a villager known for 50,000/= plus 3 beers! Then the villager is influenced to make "the right" decisions.
  - In Rungwa - the situation is worse than ever before - there is conflict in Rungwa NP.
  - On negotiations and transparency - lots of maneuvering and lack of transparency. Confusion, conflict and consumption - WD needs to be involved.
  - One major concern is THE DECISION-MAKING POWER - who gets what and how much - i.e. Regarding hunting blocks. It is essential that process must be open and conflict free.

OTHER ISSUES

- Expressed being unhappy about how trophy fee is being spent
- Trophy fee distribution is as follows
  - Treasury - Central Government
  - To villagers plus WD.
  - District

25% to WD how is it being spent?

25% to DC is it being spent wisely?

A few individuals in a village are spending what is being earned, at the expense of greater village wide development/benefits. This has brought about and will bring about many problems. Villagers must be trained - they have to be trained and educated in enterprise management.

Generally are supportive of the whole concept but are very concerned about the level and degree of corruption and poor economics and ecology.

05/04/2000 MEETING AT THE DEPT OF TOURISM

Mrs. Makere - Licensing and control.

Mrs Makere and Mr. Kasunga

Main activities include the following

- Identification of new attractions.
- Local people investment in Tourism.
- Policy and Tourism Policy.

(continuation of yesterday's meeting)

06/04/2000 TOURISM DEVELOPMENT DEPARTMENT - Dar es Salaam

Interviews/discussions with:

Mr. Idelfoas, A. Masekosa - Tourism Officer (meeting also attended by Miss Mmari)

- On Tourism Policy - it is insisting that local people should be fully involved in the management of the local resources - involvement through jobs, benefits etc. - people should participate must be involved in the planning process and be fully aware; and this is done through local government and at the village level through the VNRCs (Village Natural Resources Committee)
- Getting Local people to manage tourism
    - Participants are mostly expert and local people e.g. this is happening in Mbeya where people have invited in local tourism The Ministry is conducting seminars on this. For local tourism - development licensing procedure done only at District Level.
    - Department Authorizes only big/large tourism operations i.e. is only involved with the large scale operators - the local ones do not come to Ministry, these are done at the District level, with the District Councils and the Village Government, through VNRCs.
    - Basically foreigners have to come to the department to process their applications/investments. Issues are basically Foreign Vs local Big Vs Small

Admitted that these are still early days in implementing the new policy and so implementing Tourism Development, they are still muddling through - still at the confusion stage.

What does the external tourism operator have to pay? (will provide the relevant documents)

Department has more of a regulatory function. E.g. hoteliers are paying some 4-5 different types of fees and this is too much and government is trying to review this in order to get **one fee.**

Tanzania Investment Centre (TIC). TIC is involved in investment that are > $ 300,000 and one that may need tax holidays etc. etc.